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FINAL
SITE INSPECTION PRIORITIZATION REPORT
STAR SAND AND GRAVEL CORPORATION
SMITHTOWN, SUFFOLK COUNTY, NEW YORK

Volume 1 of 2

CERCLIS ID No.: NYD981186935

26 September 1996

Work Order No.: 04200-022-081-0135

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:

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GENERAL DESCRIPTION AND SITE HISTORY

The Star Sand and Gravel Corporation site (CERCLIS ID No. NYD981186935) is an active 34.37-acre sand mine, of which 3 acres have been used as a construction and demolition debris landfill. The site is located in the north-central portion of Long Island, 1 mile southeast of Kings Park on Lawrence Road in the town of Smithtown, Suffolk County, New York. Approximately 20 acres of the site surrounding the landfill have been used for washing, grading, and loading sand and gravel and for the stockpiling of various materials such as shredded tires, pipes, and metal debris. There is a garage, a conveyor, and an office trailer on the east side of the property. The sand pit or basin is surrounded by steep slopes of 40 feet in height on its northern, western, and southern sides. The site is primarily surrounded by wooded areas that are presently undergoing residential development. The entire property is fenced with an entrance gate on the eastern perimeter (Ref. Nos. 1, 2). Within the property boundaries and 418 feet from the southern property line, a parcel of land measuring 79.86 feet by 515.92 feet extends into the site. This parcel is owned by Anthony Leteri of USA Recycling. A second parcel, measuring 661 feet by 251.10 feet, extends in from the west on the northwestern side of the site. The owner of this property is unknown, and this property is currently undeveloped (Ref. No. 3).

Star Sand and Gravel Corporation has operated a sand mine at Lawrence Road in Smithtown since 1952. The previous owner and operator of the site was Mr. Henry Santapatry. Mr. Thomas Gesuale bought the company in approximately 1970 and is still operating the site. Landfilling at the site began in the late 1970s. Demolition debris such as concrete, brush, and brick were landfilled in the areas where sand and gravel had been removed. Large pieces of wood were chopped and sold as firewood. For a number of years, Star Sand and Gravel accepted interior sheetrock. A tire shredder was also operated on-site, however, the rubber was not burned on-site (Ref. No. 2). In 1978, the Suffolk County Department of Health Services (SCDHS) informed Mr. Gesuale that he must apply for a permit to operate the landfill. Mr. Gesuale received the landfilling permit on 8 December 1982 allowing outside haulers to bring construction and demolition materials such as concrete, brush, asphalt, and brick to the site for on-site disposal. The permit expired on 31 December 1984. (Ref. Nos. 2; 4).

A surprise inspection of the site was performed by the SCDHS on 2 February 1981. During the inspection, the SCDHS discovered that the owner was in violation of his operating permit for accepting papers, plastic, cans, fabric, and putrescible waste for landfilling. Also, the landfill was not covered on a daily basis (Ref. No. 5). State and local regulatory agencies had received numerous complaints that the site activities were causing odor problems (Ref. No. 6). It was also alleged that during early morning hours hazardous waste was being accepted for landfilling. Trucks with New Jersey license plates were reportedly seen entering the site between 2 and 4

a.m. (Ref. No. 5). According to Mr. Gesuale, the haulers were registered in New Jersey for economic reasons and because of heavy traffic on the Long Island Expressway, the truckers preferred to transport materials at night (Ref. No. 2). An early morning inspection of the site on 21 June 1984 by New York State Department of Environmental Conservation (NYSDEC) officials confirmed that the disposal of material was occurring, but found no evidence of hazardous waste being deposited at the site (Ref. No. 7).

On 22 June 1983, Star Sand and Gravel met with the NYSDEC and entered into a consent order to install groundwater monitoring wells, to collect groundwater samples, to perform a methane survey because of odors, and to restrict landfilling operations to daytime hours (Ref. No. 8). On 20 July 1983, Star Sand and Gravel began implementing the compliance schedule by performing an explosive gas survey at the site. The measurement of explosive gases, performed by H2M, indicated that there were no serious methane problems, although a smoldering fire was located at the site (Ref. No. 9). Two groundwater wells were also installed in compliance with the consent order (Ref. No. 10). The wells were sampled by NYSDEC and Star Sand and Gravel. Groundwater from the wells reportedly contained elevated levels of metals and volatile organics, but there was no upgradient well on the site at the time of sampling so the origin of the contamination could not be determined.

In 1982 and 1983, the SCDHS investigated the groundwater in the vicinity of the site. Samples were taken from four private wells upgradient of the site. Reportedly, one of these wells, located 0.5 mile south of the site, contained iron (6.67 mg/L) and 1,2,3-trichloropropane (110 mg/L) (Ref. No. 11). SCDHS advised the resident to obtain water from a new source (Ref. Nos. 12, 13). The well is hydraulically in line with the site and may indicate an upgradient source of contamination (Ref. No. 14, sec. 4.1).

On 6 August 1985, Star Sand and Gravel Corporation entered into a second consent agreement with the NYSDEC to investigate the nature and extent of groundwater contamination in the vicinity of the site and to prepare a remedial action plan (Ref. Nos. 15; 16)

NUS Corporation (NUS), a United States Environmental Protection Agency (EPA) contractor, completed a Site Inspection Report for the site on 12 June 1986. NUS collected two groundwater samples and four soil samples in and around the landfill. No organic compounds were detected in the monitoring well samples, but several metals were detected. These metals could not be attributed to the site since no upgradient monitoring well was available for comparison. The following organic compounds were detected above the contract required detection limit (CRDL) in the soil samples: butylbenzyl phthalate (15,000 ug/kg), chrysene (1,400 ug/kg), benz(a)anthracene (820 ug/kg), benz(a)pyrene (720 ug/kg), phenanthrene (1,300 ug/kg), anthracene (490 ug/kg), di-n-butyl phthalate (2,300 ug/kg), fluoranthene (1,400 ug/kg),

pyrene (1,600 ug/kg), bis(2-ethylhexyl)phthalate (3,800 ug/kg), benzo(b)fluoranthene (940 ug/kg), Aroclor-1242 (5,700 ug/kg), alpha-BHC (62.2 ug/kg), and gamma-BHC (19.2 ug/kg). Several metals were also detected: aluminum (4,181 mg/kg), chromium (9 mg/kg), cobalt (2 mg/lkg), copper (2 mg/kg), iron (7,039 mg/kg), lead (97 mg/kg), manganese (132 mg/kg), and zinc (120 mg/kg) (Ref. No. 17). The metal results do not exceed the chemical element content of natural soils (Ref. No. 21). There are no background samples for either medium, and the results currently cannot be used to document a release due to the lack of quality control/quality assurance (QA/QC) data available for review by WESTON (Ref. No. 17).

EA Science and Technology (EA) completed an Engineering Investigation at Inactive Hazardous Waste Sites Phase I investigation of the Star Sand and Gravel Corporation for the NYSDEC in June 1987. No additional sampling was completed for this report. During the Phase I visit, it was noted that there were breaks in the fence bordering the property, allowing access by foot (Ref. No. 5).

The Town of Smithtown Code Enforcement Bureau, Fire Marshal Division, conducted an inspection of the facility for fire and explosion hazards on 14 June 1990. The fire marshall cited numerous violations at the facility because of improper storage of flammable materials used at the facility, improper safety precautions, and observation that petroleum-type products had leaked and/or had been dumped at the site. These violations did not refer to any hazardous substances associated with the landfill, but were caused by day-to-day operations of the Star Sand and Gravel Corporation (Ref. No. 18).

As a result of the EA Phase I investigation, a Phase II investigation was completed in January 1992 by Roux Associates Inc. under subcontract to Gibbs & Hill, Inc. on behalf of NYSDEC. This investigation included an air survey, a geophysical survey, a soil gas survey, soil sampling, and the installation of five monitoring wells and the collection of several environmental samples (Ref. No. 14, sec. 1.0). The soil gas survey consisted of 51 soil gas samples. Four volatile organic compounds were detected across the site. Methylene chloride was detected at high concentrations (2 to 316 parts per million) on the western side of the landfill. Since the methylene chloride was only detected in one area of the site, the source of contamination may be localized. 1,2-Dichloroethylene was found in 47 of the samples taken from across the site. The concentrations of 1,2-dichloroethylene generally ranged from 0.91 to 28 ppm, with one sample at 164 ppm. Concentrations were highest to the west of the landfill but generally were over 10 ppm across the site. Detections of benzene and toluene were scattered across the site. Benzene was found in 17 samples with concentrations that ranged from trace amounts to 0.5 ppm. Toluene was found in four samples at concentrations ranging from 0.1 to 5 ppm. One sample contained ethylbenzene in trace quantities. 1,2,3-Trichloropropane was detected in 45 of the samples; however, these detections could not be quantified as the equipment could not be

calibrated because a standard for this compound was not available (Ref. No. 14, sec. 4.5).

One soil sample was collected at 10 feet from the drilling cuttings at the proposed location of MW-1. The sample was analyzed for volatile and semivolatile organic compounds. The following volatile organic compounds were detected above the contract required quantitation limit: methylene chloride (14 ug/kg), 1,2-dichloroethene (150 ug/kg), trichloroethene (28 ug/kg), tetrachloroethene (30 ug/kg), toluene (19 ug/kg), ethylbenzene (14 ug/kg), xylene (81 ug/kg), and acetone (89 ug/kg). However, acetone is a common laboratory contaminant. The following semivolatile organic compounds were also detected: phenanthrene (3,100 ug/kg), fluoranthene (2,600 ug/kg), pyrene (2,600 ug/kg), benzo(a)anthracene (2,400 ug/kg) chrysene (2,400 ug/kg), benzo(b)fluoranthene (2,500 ug/kg), benzo(a)pyrene (2,000 ug/kg), indeno (1,2,3-cd) pyrene (1,100 ug/kg) and benzo(g,h,i)perylene (1,300 ug/kg) (Ref. No. 14).

Six groundwater samples, including a duplicate sample, were collected from the five monitoring wells located on-site (monitoring wells MW-1 through MW-5). Sample MW-4 was a duplicate sample collected from monitoring well MW-3. Monitoring well MW-1 is an upgradient monitoring well. No volatile or semivolatile organic compounds, pesticides, or PCBs were detected above the CRDL in the monitoring wells. Aluminum, iron, lead, manganese, nickel, vanadium, and zinc were detected in sample MW-2 at concentrations greater than three times the upgradient well concentration. The analytes detected in sample MW-2 as well as magnesium and sodium were detected in MW-3 at three times the upgradient concentration (Ref. No. 14). These analytes and their respective highest concentrations are listed in Table 1.

In January 1994, Star Sand and Gravel Corporation entered into a third consent order with the NYSDEC. This order required extensive remediation and restoration of the site. Star Sand and Gravel hired Treatment Technology Corporation (TTC) to complete the required work plan and to begin site cleanup. The work plan divided the site into 10 different zones. The plan for each zone was to clear all surface debris and excavate test pits in each zone on a fifty-foot interval to identify subsurface conditions. Samples were collected in suspect pits and sent to a certified laboratory for analysis. The zone was then filled with clean fill, graded, compacted and seeded. This work was overseen by the NYSDEC (Ref. No. 3). Three test pit samples were collected on 11 May 1995 in Zones 1 and 2. Two of these samples (SP-1 and SP-3) were analyzed for the following metals: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. The other sample (SP-2) was analyzed for volatile organic compounds, PCB concentrations, and TCLP metals. The depths of these three test pit samples are unknown. All volatile organic compounds and PCB concentrations were detected below the CRDLs. Arsenic, barium, chromium, and lead were detected in SP-1; and chromium and lead were detected in SP-3 (Ref. No. 19). On 20 July 1995, TCC collected one sample designated as an off-site, background soil sample for metals analysis (Ref. No. 20). Samples SP-1 and SP-2 were

Table 1
Groundwater Sampling Results Exceeding Upgradient Concentrations
Star Sand and Gravel Corporation
Smithtown, Suffolk County, New York

Compound	Highest Concentration	Background Concentration (MW-1)
Aluminum	59,000	8,600
Iron	81,300	6,810
Lead	36.6	4.3 B
Magnesium	81,600	5,470
Manganese	2,860	719
Nickel	71.8	15.9 B
Sodium	233,000	26,500
Vanadium	136	7.2 B
Zinc	150	30

B = Reported value is less than the Contract Required Detection Limit (CRDL) but is greater than the instrument detection limit (IDL).

Note: All concentrations are in $\mu g/L$.

compared to the background sample, and none of the metals exceeded three times the background values.

TTC collected samples from monitoring wells MW-1, MW-2, and MW-3 on 25 September 1996. All samples were analyzed for volatile organic compounds and for the following metals: silver, arsenic, lead, cadmium, chromium, mercury, selenium and barium. Barium was detected in all three samples at concentrations ranging from 0.01 to 0.22 mg/l. No other metals were detected. Acetone and methylene chloride were detected in sample MW-3; however, these compounds are both common laboratory contaminants. No other volatile organic compounds were detected (Ref. No. 3). According to the TTC 1995 Annual Site Summary Report for Star Sand and Gravel, a second round of well sampling was conducted in November 1995, but the results of this sampling were not available for review by WESTON (Ref. No. 3).

Access to the site is limited by a fence with a locking gate across the main entrance; however, past reports indicated that the fence is in disrepair so the site may be accessed by foot. The northern, western, and southern sides of the sand and gravel operation are surrounded by 40-foot walls (Ref. Nos. 1, 14, sec.4.1).

EVALUATION OF EXISTING INFORMATION AND SITE INSPECTION REPORT

Existing information and analytical data, obtained primarily from the June 1987 EA Science and Technology Phase I Report, the January 1992 Roux Associates Phase II Report, and the February 1996 Treatment and Technology Corp. Star Sand and Gravel Annual Site Summary Report for 1995, were used to conduct this evaluation. Based on the existing information, only volatile organic compounds and semivolatile organic compounds can be used to characterize the landfill. Soil metal results from the NUS investigation could not be used because of the lack of a background sample and because none of the compounds exceeded the chemical element content of natural soils (Ref. No. 21) Updated and additional data were collected to further evaluate the site to determine the need for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial action. The additional information used to evaluate the current site status included information regarding drinking water wells within a 4-mile radius of the site, wellhead protection area information, 1990 census population data, and sensitive environments information, including threatened and endangered species habitats within 4 miles of the site.

HAZARD ASSESSMENT

Groundwater Pathway - A release of hazardous substances from Star Sand and Gravel

Corporation to groundwater is suspected. The Phase II investigation sampling showed the presence of aluminum, iron, lead, magnesium, manganese, nickel, sodium, vanadium, and zinc in downgradient monitoring wells at concentrations greater than three times the upgradient well concentration or above the contract required detection limit/sample quantitation limit (CRDL/SQL). Elevated levels of barium were also found during a round of sampling on 25 September 1995 conducted by TTC. However, the data do not meet the requirements of the U.S. EPA Contract Laboratory Program and/or sufficient QA/QC are not available. Therefore, the downgradient analyte detections exceeding background concentration cannot be used for documenting an observed release to groundwater.

The site is directly underlain by Pleistocene Age glaciofluvial deposits. These deposits are underlain by the following in descending order: the Cretaceous Age Matawan Group-Magothy Formation (undifferentiated), the Clay Member and Lloyd Sand Member of the Raritan Formation, and by Precambrian age crystalline metamorphic and igneous rocks. The glacial deposits appear to be 150 to 200 feet in thickness and are comprised of stratified sand and gravel with thick to thin discontinuous layers of silt and clay (Ref. No. 22). A deep well in the vicinity of the site indicates that the glacial deposits extend to a depth of 75 feet below the National Geodetic Vertical Datum of 1929, thus placing the Magothy-glacial interface at approximately 175 feet below land surface elevation at the site (Ref. No. 14, sec. 4.4). The Matawan Group-Magothy Formation (undifferentiated) is estimated to be 450 feet in thickness (Ref. No. 23). The upper surface of this deposit is irregular because of considerable erosion during the Tertiary and Pleistocene times. The upper portion of this formation is generally composed of interbedded clay, fine to medium sand, silt and some lignite; while the lower portion is generally coarse sand, gravel, and some clay. The clay and silt beds are apparently discontinuous lenses as indicated on local geologic logs (Ref. No. 24).

Aquifers underlying Suffolk County are the sole source of water for public supply, agriculture, and industry (Ref. No. 24). The glacial deposits and Magothy aquifers act as a single hydrological unit. Both aquifers are developed by wells for water supply with 4 miles of the site. The Lloyd aquifer, though moderately permeable, has not been developed for water supply because more permeable aquifers are present at shallower depths. Recharge to the glacial aquifer is derived entirely from precipitation. Recharge to the Magothy and Lloyd aquifers is derived entirely from the downward movement of water from each overlying aquifer (Ref. No. 22).

Water level measurements taken at the site on 13 August 1991 indicate that the depth to the water table is approximately 49 feet, and groundwater generally flows to the northwest toward Long Island Sound. The water level measurements taken on 15 January and 22 April 1991 indicate that groundwater flows generally to the north-northwest with each measurement having

converging and diverging flow patterns. These alternate flow patterns can be attributed to differences in precipitation and recharge that traditionally occur at each of these times of year and are temporary conditions (Ref. No. 14, sec. 4.4).

Groundwater is used extensively as a source of drinking water within 4 miles of the site. Suffolk County Water Authority (SCWA) serves the entire 4-mile radius surrounding the site. This area is known as the Smithtown district and includes 20 well fields consisting of 52 wells. All of the water in the Smithtown District is blended. Fifteen wells are screened in the glacial aquifer with the remaining 37 wells in the Magothy aquifer. There are approximately 79,612 people drinking water from SCWA within a 4-mile radius of the site (0-¼ mile: 0; ¼-½ mile: 0; ½-1 mile: 6,124; 1-2 miles: 19,903; 2-3 miles: 30,620; 3-4 miles: 22,965) (Ref. No. 25). There are wellhead protection areas in Suffolk County within 4 miles of the site (Ref. Nos.).

Surface Water Migration Pathway - There is no surface water migration pathway associated with the site. The site is surrounded on the northern, western, and southern sides by 40-foot walls. The nearest surface water body is a tributary to Willow Pond, approximately 1.25 miles southeast of the site. There is no viable overland route from the site to this surface water body because of higher intervening terrain. In addition, there are numerous groundwater infiltration galleries between the site and the tributary to Willow pond (Ref. No. 1).

Soil Exposure Pathway - Soil contamination at the site is suspected but not confirmed. Four soil samples were collected by NUS in 1986. However these results are not usable to document a release due to the lack of QA/QC data available for review by WESTON. The one soil sample collected during the Phase II investigation was collected at a depth of 10 feet and was only analyzed for volatile and semivolatile organic compounds. The depth of the three test pits collected in May 1995 and the background soil sample collected in July 1995 by TTC is unknown. There are no soil sample analytical results for soil located between 0 to 2 feet below ground surface. Therefore, an observed release to surficial soil cannot be documented.

There are no schools, residences, or daycare facilities within 200 feet of potentially contaminated soil (Ref. No. 1). The number of full time employees on-site is unknown. Truck drivers frequently access the site to load from the sand and gravel operation. Trucks also bring clean fill to the site to be used in the site remediation and restoration consent order. It is assumed that 5 workers are present on-site. Access to the site is limited by a fence with a locking gate across the main entrance, however, past reports indicated that the fence is in disrepair so the site can be accessed by foot. The northern, western, and southern sides of the sand and gravel operation are surrounded by 40-foot walls (Ref. Nos. 14, sec. 4.1).

Air Migration Pathway - An observed release of contaminants to air has not been documented.

An air monitoring survey was conducted by Roux Associates at the site on 25 May 1990. The purpose was to determine the quality of air in and around the landfill portion of the site in order to delineate the source of any airborne contaminants. A perimeter survey of the site was conducted with a flame ionization detector, a photoionization detector, a Tri-Gas meter, and a radiometer. According to the Phase II report, the only readings observed were 10 to 15 microroentgens per hour (ur/hr) on the radiometer, which were within the normal background radiation ranges of 5 ur/hr to 25 ur/hr. During the drilling of monitoring well MW-1, a reading in excess of 1,500 units on the photoionization detector was recorded. The hole was abandoned and the well location was moved. This reading cannot be used to document a release of contaminants to the air pathway. No analytical data are available to indicate if a release to air has occurred (Ref. No. 14, sec. 4.3). A soil gas survey conducted in January 1992 detected four volatile organic compounds present around the site including methylene chloride, 1,2-dichloroethylene, benzene and toluene. However, there is no documentation that these compounds were released into the ambient air (Ref. No. 14, sec.4.5). Nine State-listed threatened or endangered species habitats are known to exist within a 4-mile radius of the site. Eight of the nine habitats are within a 3-mile radius of the site, while one habitat is almost 4 miles from the site (Ref. No. 28). There are approximately 1,607 acres of wetlands located within a 4-mile radius of the site (0-¼ mile: 0; ¼-½ mile: 0; ½-1 mile: 7; 1-2 miles: 90; 2-3 miles: 835; 3-4 miles: 675) (Ref. No. 29). There are approximately 101,050 people living within a 4-mile radius of the site (0-¼ mile: 270; ¼-½ mile: 960; ½-1 mile: 6,890; 1-2 miles: 28,080; 2-3 miles: 27,500; 3-4 miles: 37,350) (Ref. No. 30).

SUMMARY

The existing information and the additional data collected were sufficient to evaluate the site. The assessment indicates that the site possesses a medium threat to human health and the environment. Volatile and semivolatile organic compounds, pesticides and a PCB are present in on-site soil. However, there are no residential properties within 200 feet of these soils. Drinking water within 4 miles of the site is supplied by an extensive well system and by the Suffolk County Water Authority. The wells are part of the Smithtown district and serve 79,612 people. The wells are screened in the glacial and Magothy aquifers which act as a single hydrogeologic unit. There is no indication of volatile and semivolatile organic compounds or pesticides/PCBs in on-site monitoring wells. Several metals were detected in the downgradient monitoring wells at concentrations greater than three times the upgradient concentrations. There is no surface water migration pathway because of intervening terrain and the numerous groundwater infiltration galleries in the area. There are nine State-listed threatened or endangered species habitats within a 4-mile radius of the site.

REFERENCES

1. Four-Mile Vicinity Map for Star Sand and Gravel, based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 Minute Series, Quadrangles of Greenlawn, NY; Central Islip, NY; Northpoint, NY; and St. James, NY; all topos from 1967, photorevised 1979.

2. Schultz/Ligotino, EA Science and Technology; Interview Acknowledgment Form, ID# 1520976; 21 January 1986.

3. Treatment Technology Corp., Star Sand and Gravel Annual Site Summary Report for 1995; February 1996.

4. New York State Department of Environmental Conservation, Application for Approval to Operate a Solid Waste Management Facility; November 1978.

5. Engineering Investigations at Inactive Hazardous Waste Sites, Phase I Investigation for NYSDEC, EA Science and Technology; June 1987.

6. Steve Kramer, County of Suffolk Department of Health Services, letter to Mr. Gesuale; 19 May 1983.

7. Memorandum from: ECO Kelley, New York State Department of Environmental Conservation. To: Lt. Huss/Capt. Otterstedt; 21 June 1984.

8. Compliance Conference - Star Sand and Gravel; 3 January 1984.

9. Michael Bontje; Holzmacher, McLendon, and Murrel P.C.; letter to Mr. Gesuale; 22 July 1983.

10. James Heil; New York State Department of Environmental Conservation; letter to Mr. Gesuale; 24 August 1983.

11. Memorandum from D. Moran; Suffolk County Department of Health Services. To: James Maloney; 23 September 1983.

12. Martin Trent, County of Suffolk Department of Health Services; letter to Mr. Szymanski; 13 December 1982.

13. Martin Trent, County of Suffolk Department of Health Services; letter to Mr. Szymanski; 29 October 1982.

14. Engineering Investigations at Inactive Hazardous Waste Sites; Phase II Investigation for NYSDEC - Sections 1.0, 4.0 through 4.7, and Tables 1 though 4; Roux Associates and Gibbs and Hill, Inc.; January 1992.

15. Memorandum from: P. Barbato, New York State Department of the Environment. To: J. Scherb; 1 October 1984.

16. New York State Department of Environmental Conservation; Order of Consent - Star Sand and Gravel Corp.; August 1985.

17. Final Draft Site Inspection Report and Hazardous Ranking System Model Star Sand and Gravel, NUS Corporation; 13 June 1986.

18. John Valentine, Town of Smithtown; letter to Eric Arnesen, Roux Associates; 18 June 1990.

19. NYTEST Environmental, Analytical Data Report Package for Treatment Technology Corp.; 31 May 1995.

20. NYTEST Environmental, Analytical Data Report Package For Treatment Technology Corp.; September 1995.

21. Hazardous Waste Land Treatment - SW-874, U.S. EPA Office of Solid Waste and Emergency Response, Table 6.46, p. 273; April 1983.

22. E. R. Lubke, Hydrogeology of the Huntington-Smithtown area, Suffolk County, New York; Geological Survey Water-Supply Paper 1669-D; 1964.

23. James Schultz, EA Science and Technology; Communication Record Form to Ron Smalls; County Well Drilling Corp.; 28 March 1986.

24. H. M. Jensen and J. Soren; Hydrogeology of Suffolk County, Long Island, New York; 1974.

25. Project Note from Tonya Balla, WESTON, to the Star Sand and Gravel file; Subject: Drinking Water Supply plus attachments; September 1996.

26. Project Note from Tonya Balla, WESTON, to the Star Sand and Gravel file; Subject: Well Protection Areas (plus attachments); September 1996.

27. Federal Emergency Management Agency; FIRM, Town of Smithtown, New York, Suffolk County, Community Panel No. 360810 0003C; 2 June 1992.

28. Project Note from Tonya Balla, WESTON, to the Star Sand and Gravel file; Subject: Sensitive Environments, plus attachments; September 1996.

29. Four Mile Vicinity Wetland Map for Star Sand and Gravel compiled from U.S. Department of the Interior, Fish and Wildlife Services, National Wetland Inventory Maps, 7.5 Minute Series, Quadrangles of Greenlawn, NY; Central Islip,NY; Northpoint, NY; and St. James, NY; all aerial photos from April 1980.

30. Letter from Bob Frost, Frost Associates, to Jan Holderness, WESTON, Subject: Star Sand and Gravel Population Data; 10 June 1996.

REFERENCE NO. 1


LONG ISLAND SOUND
SMITHTOWN BAY
WESTON
FOUR-MILE VICINITY MAP
SITE NAME:
STAR SAND AND GRAVEL CORPORATION
SMITHTOWN, NY
DATE:
5 JULY 1996
SCALE:
1"=2,000'
USGS QUAD:
CENTRAL ISLIP, N.Y


LONG ISLAND SOUND
NORTHPORT BAY
LEGEND

REFERENCE NO. 2

Appendix 1.1-1
p1 of 2.

INTERVIEW ACKNOWLEDGEMENT FORM

Site Name: Star Sand & Gravel Corporation

I.D. Number: 152097

Person Contacted: Mr. Tom Gesuale

Date: 21 January 1986

Title: Owner/Operator

Affiliation: Star Sand & Gravel Corp.

Phone No.: (516) 544-9884

Address: 36 Landview Drive
Dix Hills, New York 11746

Persons Making Contact:
EA Representatives:

Shultz/Ligotino

Type of Contact: In Person

Interview Summary:

Star Sand and Gravel Corporation has operated at Lawrence Road in Smithtown, New York for the past 50 years. The previous owner and operator of the site was Mr. Henry Santapatry. Mr. Gesuale bought the company 15-17 years ago, and insists that his business is more of a mining operation than a landfill. Of the 40-acre plot, only 3 acres are actual dump (an L-shaped area approximately 300 feet wide, 500 feet long, and 30 feet deep). The remainder is used for sand and gravel washing, grading, and loading. The dumping occurred during the last 4-5 years. Mr. Gesuale has used demolition debris to fill in a portion of the area where sand and gravel has been removed. Materials such as concrete, brush, and brick have been deposited. Larger pieces of wood are chopped and sold for firewood. Concrete is no longer used as fill, but is shredded and crushed and piled on site. For a number of years, Star Sand and Gravel accepted interior sheetrock in the dump. Mr. Gesuale believes the paint on this sheetrock is the source of cadmium contamination in the ground water. The dump has not accepted the sheetrock for approximately 7 months (since May 1985), and never accepted metal. Currently, only dirt and rock is accepted in the 30-ft deep dump, and Mr. Gesuale intends to level the site off when he is done. Mr. Gesuale operates a tire shredder on site, but does not burn the rubber. There have been numerous complaints by local residents about odors emitting from the Star Sand and Gravel dump, but Mr. Gesuale firmly believes the smells came from the Smithtown dump nearby. However, he does throw dirt over his dump to eliminate the possiblity of migrating odors.

Mr. Gesuale first applied for a permit to operate a demolition debris disposal site in 1978 when informed by the Suffolk County Department of Health Services (SCDHS) that such a permit was necessary. Prior to this, only Star Sand and Gravel had dumped materials at the site. After receiving a permit, Mr. Gesuale did allow some outside haulers to bring materials in. Currently, the site is not permitted as a disposal site.

In 1983, Mr. Gesuale entered into a compliance schedule targeted at eliminating odor problems at the site and investigating ground-water contamination. Ground-water monitoring wells were installed and a methane study performed. At the time, the New York State Department of Environmental Conservation (NYSDEC) suspicious of fires had Mr. Gesuale dig up the disposal area and nothing was

found. The testing for methane found none. In 1985, Mr. Gesuale entered into a Consent Agreement with the NYSDEC to determine the nature and extent of ground-water contamination and to prepare a remedial action plan. Mr. Gesuale indicated that he is trying to determine just what remedial actions are necessary, and has met with Mr. John Iannotti, at the NYSDEC Bureau of Remedial Action. Remedial measures may include installation of a liner.

Two ground-water monitoring wells on site were installed by Mr. Gesuale by 24 August 1983. He also has a water supply well on site. Each well is approximately 80 feet deep, and is only drilled to first water. The wells are tested by Mr. Gesuale for four different chemicals. The NYSDEC also tests these wells.

Neighbors have complained to state agencies that dumping by New Jersey registered trucks occurs around the clock, even after midnight. In addition, Mr. Gesuale pointed out that the trucks hauling sand and gravel are registered in New Jersey for economic advantages, and that due to heavy traffic on the Long Island Expressway, the trucks prefer to run at night.

Acknowledgement:

I have read the above transcript and I agree that it is an accurate summary of the information verbally conveyed to EA Science and Technology interviewers, or as I have revised below, is an accurate account.

Revisions (please write in corrections to above transcript):

Signature: Thomas Gesuale Date: 6/12/86

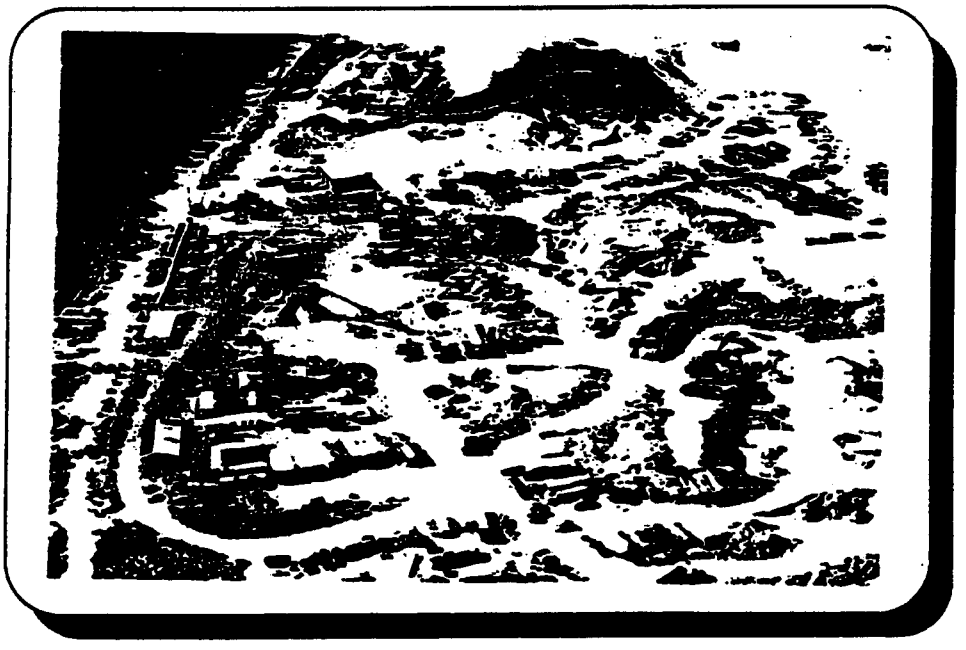
REFERENCE NO. 3

STAR SAND & GRAVEL

ANNUAL SITE SUMMARY REPORT

FOR

1995



FEBRUARY 1996

Prepared by

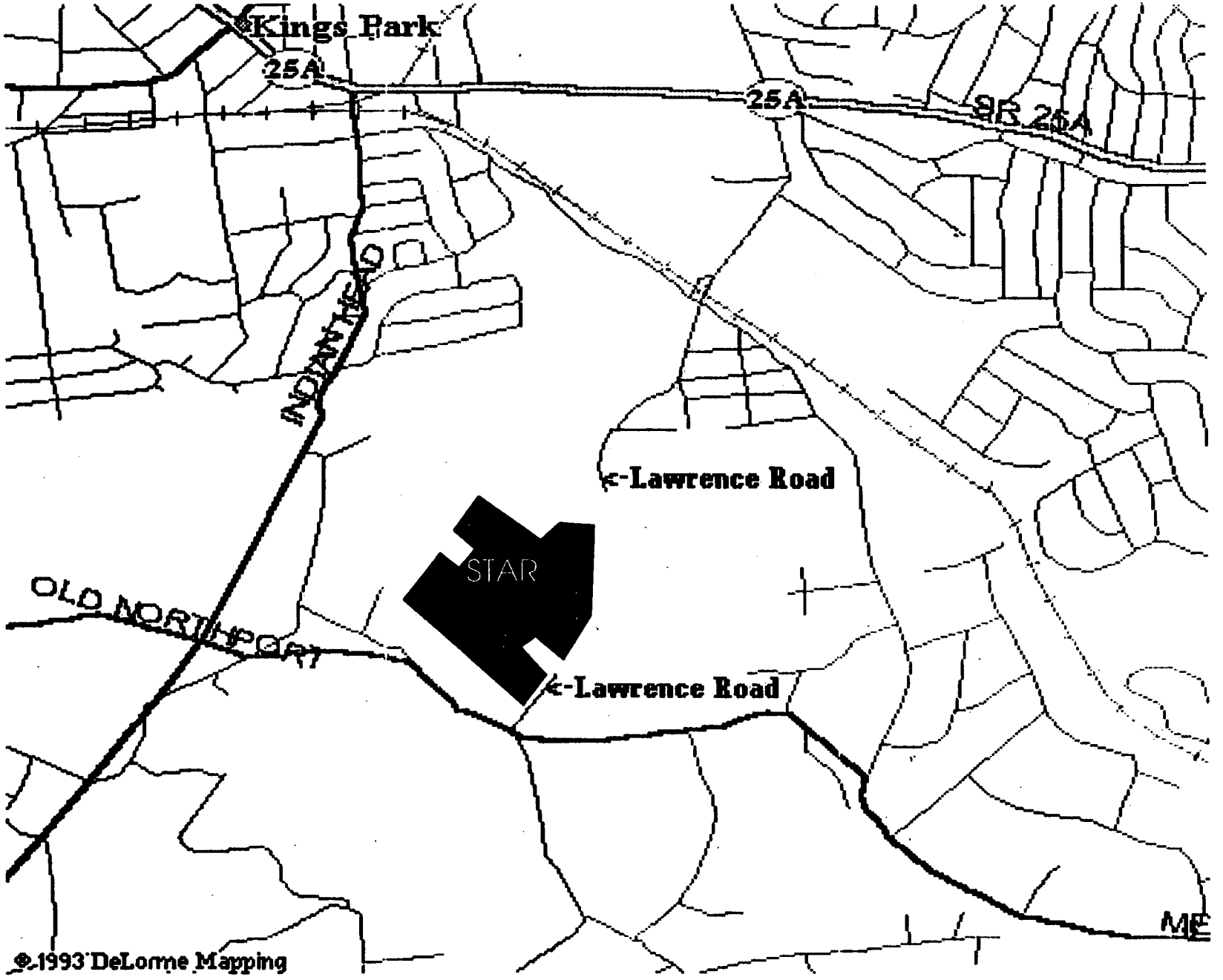
Treatment Technology Corp.
Solids Management Corp.
64 Smithtown Blvd.
Smithtown, New York 11787

STAR SAND & GRAVEL SITE
SITE RESTORATION
1995 SITE SUMMARY REPORT

PURPOSE:

This site visitation and summary report is presented in response to New York State Department of Environmental Conservation's (NYSDEC) Consent Order File Number 1-3552, dated January 3, 1994. The summary report and site inspection is being provided to demonstrate the progress that has been made during 1995 and to show conformance with the work plan submitted to NYSDEC January 1995 and accepted May 1995.

STAR SAND & GRAVEL



SITE LOCATION MAP

STAR SAND & GRAVEL

SITE CONDITIONS 3/30/94

SITE DESCRIPTION

The Star Sand and Gravel Corp. Site is 34.37 acres located on Lawrence Road approximately one mile southeast of Kings Park, Town of Smithtown, Suffolk County, New York (Site Map). The sand pit or basin is surrounded by steep slopes of approximately 40 feet on its north, west, and south sides. Access to the site is from the east via Lawrence Road, an unimproved dirt road leading to the site. The site ranges from 144 feet above sea level on the north side of the property to 62 feet on the southwest side of the site. The highest elevation on the property is 154.4 feet and 46.2 feet is the lowest elevation. The regional terrain slopes gently to the south-east at approximately 1.25%.

The Site is mostly surrounded by wooded areas presently undergoing residential development. To the south is a commercial property, Carlson Precast Concrete Products, which is also a sand pit, located 0.22 miles away. Within the property boundaries 418 feet from the southern property line a parcel 79.86 feet by 515.92 feet extends into the site and is owned by Anthony Leteri, USA Recycling. A second parcel extends in from the west in the northwest side 661 feet by 251.10 feet. The property is currently undeveloped. (1994 Aerial Photo)

REMEDIATION APPROACH

1. Site was divided into ten zones plus a landfill zone. The number of zones does not necessarily indicate the order in which it will be restored. (Refer to Zone Map)

2. The zone is cleared of all surface debris such as wood, junk vehicles, steel etc. The steel is recycled and delivered to secondary vendors.

3. Test pits are excavated in each zone on a fifty (50) foot interval. Each test pit is excavated to identify sub-surface conditions until native material is encountered. Boring logs are generated for each test pit.

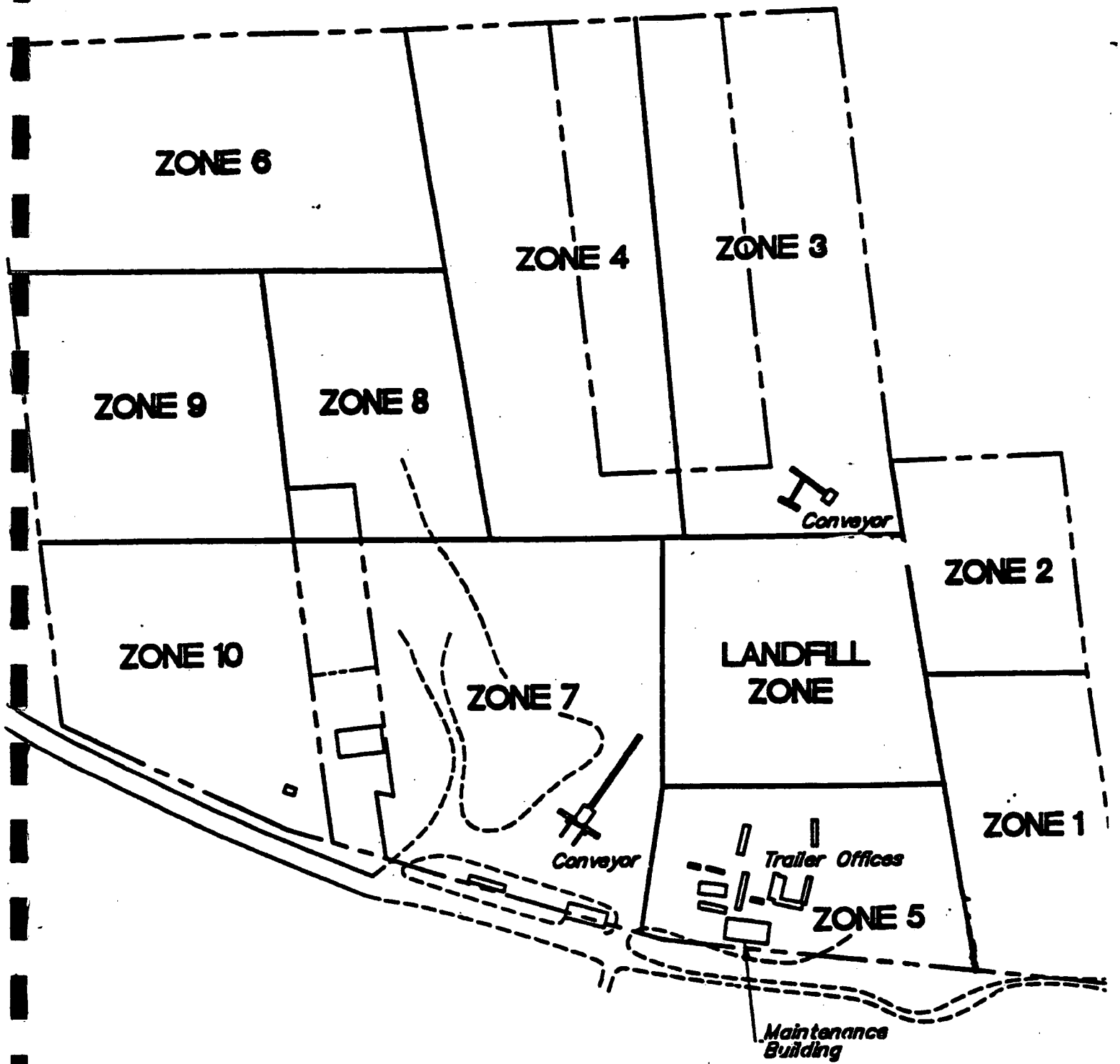
4. Soil samples are collected in suspect test pits or within each zone and sent to a Certified laboratory for analysis for contamination.

5. The zone is then filled with clean fill consisting of dirt, soil, rock, concrete, stone.

6. The zone is continuously graded, compacted and shaped during the filling process.

7. Finally the zone will be seeded and planted when the final approved grade has been reached.

STAR SAND & GRAVEL



ZONE MAP

CLEAN FILL
REQUIREMENTS AND PROCEDURES

1. Material arrives at the site, and the driver enters the office, the material is inspected in the truck.

2. A tracking document is completed and signed by the office manager and the driver indicating that the material is non-hazardous. (Refer to Tracking Document)

3. A marker flag, labeled with the corresponding tracking document number is given to the driver so it may be placed in the pile of material that is disposed.

4. NYSDEC and Treatment Technology inspect each load and then sign off on the tracking document indicating that the material is acceptable for disposal and restoration.

5. The material is then graded and compacted.

6. Occasionally some loads need to be cleaned of debris such as wood or steel. The debris is picked and placed in a container for proper disposal.

7. If a site from which material is to be delivered is in excess of 300 yards NYSDEC is advised and the material is inspected by Treatment Technology at the source and must be approved prior to being brought to the site. Material in excess of 100 yards NYSDEC and Treatment Technology are advised of the source and a full description of the material prior to being brought to the site.

8. If any material is deemed to be unacceptable by NYSDEC or Treatment Technology the material is segregated and removed from the site.

SUMMARY OF EVENTS

January 21	Draft Work Plan Submitted to NYSDEC by Treatment Technology
March 17	Review meeting with NYSDEC Town of Smithtown to review Work Plan
April 3	Receiving area marked and test pits for area
May 1	Submission of Final Work Plan
May 9	Approval of Final Work Plan
May 1-10	Cleaning of Zone 1 & 2
May 11	Test Pits Zone 1 & 2
June 22	Test Pits Zone 6
July 20	Test Pits Zone 3
September 25	Wells sampled on Site
October 5	Revisions & Updates to Workplan
November 11	Well Sampled
November	Zone 3 partial cleared
December	Completion of Zone 3 Clearing
December	Goals for 1996

CONCLUSIONS

In conclusion the we feel that progress has been made at the site. We realize that there is still a great deal to be accomplished but the site restoration is being achieved. The cooperation between Mr. Thomas Gesuale Jr., Carl Fritz Jr. NYSDEC Project Monitor and Treatment Technology has made this progress possible, we feel it has been a successful first year and we look forward to continuing during 1996.

SAMPLE COLLECTION / CHAIN OF CUSTODY RECORD

Pedneault Associates, Inc.
1615 NINTH AVENUE
BOHEMIA, NEW YORK 11716
PHONE: (516) 467-8477 / FAX: (516) 467-6905

CLIENT: BEE CTreatment

ADDRESS:

CITY, STATE, ZIP:

PHONE / FAX:

PAGE 1 OF 1

P.O. #:

JOB #:

PROJECT NAME AND/OR LOCATION: STAIR SAND + GRAVEL, KINGS PARK, NY

LAB NUMBER: 107780

#	DATE	TIME	SAMPLE COMP	SAMPLE GRAB	MATRIX S	MATRIX L	MATRIX G	SAMPLE ORIGIN	SAMPLE CONTAINERS	ANALYSIS	#
1	9/25/95	12:45		X		X		WELLS - MONITORING	3-40mL	EPA 8240 VOLATILES	1
2	↓	↓		↓		↓		↓	3-250mL	TOTAL [redacted] RCRA METALS	2
3											3
4											4
5											5
6											6
7											7
8											8
9											9
10											10

SAMPLED BY: [signature]

SPECIAL INSTRUCTIONS: Bill BEE

RELINQUISHED BY: [signature]

DATE: 9/25/95 TIME: 2:10

RECEIVED BY: [signature]

DATE: 9/25/95 TIME: 2:50

RECIEVED AT LAB BY: Monica Schmidt

DATE: 9/25/95 TIME: 3:50

REMARKS

SHIPPING CONTAINER CONDITION

PACKED IN ICE?

PEDNEAULT ASSOCIATES, INC. TESTING LABORATORIES
1615 NINTH AVENUE • P.O. BOX 205 • BOHEMIA, N.Y. 11716 • (516) 467-8477
FAX: (516) 467-6905 After 5pm: (516) 567-5579

BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 1

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/09/95

PARAMETER	RESULTS	UNIT	METHOD
METALS			
SILVER	<0.005	mg/l	272.2
ARSENIC	<0.300	mg/l	206.2
LEAD	<0.005	mg/l	239.2
CADMIUM	<0.001	mg/l	213.2
CHROMIUM	<0.020	mg/l	218.2
MERCURY	<0.0005	mg/l	245.2
SELENIUM	<0.250	mg/l	270.2
BARIUM	0.01	mg/l	208.2

REMARKS:
ELAP# 10224
107780 -1

JOHN PEDNEAULT
LABORATORY DIRECTOR

PEDNEAULT ASSOCIATES, INC. TESTING LABORATORIES
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BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 2

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/09/95

PARAMETER	RESULTS	UNIT	METHOD
METALS			
SILVER	<0.005	mg/l	272.2
ARSENIC	<0.300	mg/l	206.2
LEAD	<0.005	mg/l	239.2
CADMIUM	<0.001	mg/l	213.2
CHROMIUM	<0.020	mg/l	218.2
MERCURY	<0.0005	mg/l	245.2
SELENIUM	<0.250	mg/l	270.2
BARIUM	0.22	mg/l	208.2

REMARKS:
ELAP# 10224
107780 -2

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BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 3

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/09/95

PARAMETER	RESULTS	UNIT	METHOD
METALS			
SILVER	<0.005	mg/l	272.2
ARSENIC	<0.300	mg/l	206.2
LEAD	<0.005	mg/l	239.2
CADMIUM	<0.001	mg/l	213.2
ROMIUM	<0.020	mg/l	218.2
MERCURY	<0.0005	mg/l	245.2
SELENIUM	<0.250	mg/l	270.2
BARIUM	0.07	mg/l	208.2

REMARKS:
ELAP# 10224
107780 -3

JOHN PEDNEAULT
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BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 1

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
ACETONE	<5.0	ug/l
ACETONITRILE	<100	ug/l
ACROLEIN	<100	ug/l
ACRYLONITRILE	<100	ug/l
ALLYL ALCOHOL	<100	ug/l
ALLYL CHLORIDE	<5.0	ug/l
BENZENE	<5.0	ug/l
BENZYL CHLORIDE	<100	ug/l
BROMOACETONE	<100	ug/l
BROMODICHLOROMETHANE	<5.0	ug/l
BROMOFORM	<5.0	ug/l
BROMOMETHANE	<10.0	ug/l
2-BUTANONE	<100	ug/l
CARBON DISULFIDE	<100	ug/l
CARBON TETRACHLORIDE	<5.0	ug/l
CHLOROBENZENE	<5.0	ug/l
CHLORODIBROMOMETHANE	<5.0	ug/l
CHLOROETHANE	<10.0	ug/l
2-CHLOROETHANOL	<100	ug/l
2-CHLOROETHYL VINYL ETHER	<10.0	ug/l
CHLOROFORM	<5.0	ug/l
CHLOROMETHANE	<10	ug/l
CHLOROPRENE	<5.0	ug/l
1,2-DIBROMO-3-CHLOROPROPANE	<100	ug/l
1,2-DIBROMOETHANE	<5.0	ug/l
DIBROMOMETHANE	<5.0	ug/l
1,4-DICHLORO-2-BUTENE	<100	ug/l
DICHLORODIFLUOROMETHANE	<5.0	ug/l
1,1-DICHLOROETHANE	<5.0	ug/l
1,2-DICHLOROETHANE	<5.0	ug/l
1,1-DICHLOROETHENE	<5.0	ug/l
trans-1,2-DICHLOROETHENE	<5.0	ug/l
1,2-DICHLOROPROPANE	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -1

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BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 1

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/09/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
1,3-DICHLORO-2-PROPANOL	<100	ug/l
cis-1,3-DICHLOROPROPENE	<5.0	ug/l
trans-1,3-DICHLOROPROPENE	<5.0	ug/l
1,2:3,4-DIEPOXYBUTANE	<100	ug/l
1,4-DIOXANE	<100	ug/l
ETHYLBENZENE	<5.0	ug/l
ETHYLENE OXIDE	<100	ug/l
ETHYL METHACRYLATE	<5.0	ug/l
2-HEXANONE	<50.0	ug/l
IODOMETHANE	<5.0	ug/l
ISOBUTYL ALCOHOL	<100	ug/l
MALONONITRILE	<100	ug/l
METHACRYLONITRILE	<100	ug/l
METHYLENE CHLORIDE	<5.0	ug/l
METHYL IODIDE	<5.0	ug/l
METHYL METHACRYLATE	<5.0	ug/l
4-METHYL-2-PENTANONE	<50.0	ug/l
2-PICOLINE	<100	ug/l
PROPARGYL ALCOHOL	<100	ug/l
b-PROPIOLACTONE	<100	ug/l
PROPIONITRILE	<100	ug/l
n-PROPYLAMINE	<100	ug/l
STYRENE	<5.0	ug/l
1,1,1,2-TETRACHLOROETHANE	<5.0	ug/l
1,1,2,2-TETRACHLOROETHANE	<5.0	ug/l
TETRACHLOROETHENE	<5.0	ug/l
TOLUENE	<5.0	ug/l
1,1,1-TRICHLOROETHANE	<5.0	ug/l
1,1,2-TRICHLOROETHANE	<5.0	ug/l
TRICHLOROETHENE	<5.0	ug/l
TRICHLOROFLUOROMETHANE	<5.0	ug/l
1,2,3-TRICHLOROPROPANE	<5.0	ug/l
VINYL ACETATE	<50.0	ug/l

REMARKS:
ELAP# 10224
107780 -1

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BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 1

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
VINYL CHLORIDE	<10.0	ug/l
XYLENE (TOTAL)	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -1

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PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 2

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
ACETONE	<5.0	ug/l
ACETONITRILE	<100	ug/l
ACROLEIN	<100	ug/l
ACRYLONITRILE	<100	ug/l
ALLYL ALCOHOL	<100	ug/l
ALLYL CHLORIDE	<5.0	ug/l
BENZENE	<5.0	ug/l
BENZYL CHLORIDE	<100	ug/l
BROMOACETONE	<100	ug/l
BROMODICHLOROMETHANE	<5.0	ug/l
BROMOFORM	<5.0	ug/l
BROMOMETHANE	<10.0	ug/l
2-BUTANONE	<100	ug/l
CARBON DISULFIDE	<100	ug/l
CARBON TETRACHLORIDE	<5.0	ug/l
CHLOROBENZENE	<5.0	ug/l
CHLORODIBROMOMETHANE	<5.0	ug/l
CHLOROETHANE	<10.0	ug/l
2-CHLOROETHANOL	<100	ug/l
2-CHLOROETHYL VINYL ETHER	<10.0	ug/l
CHLOROFORM	<5.0	ug/l
CHLOROMETHANE	<10.0	ug/l
CHLOROPRENE	<5.0	ug/l
1,2-DIBROMO-3-CHLOROPROPANE	<100	ug/l
1,2-DIBROMOETHANE	<5.0	ug/l
DIBROMOMETHANE	<5.0	ug/l
1,4-DICHLORO-2-BUTENE	<100	ug/l
DICHLORODIFLUOROMETHANE	<5.0	ug/l
1,1-DICHLOROETHANE	<5.0	ug/l
1,2-DICHLOROETHANE	<5.0	ug/l
1,1-DICHLOROETHENE	<5.0	ug/l
trans-1,2-DICHLOROETHENE	<5.0	ug/l
1,2-DICHLOROPROPANE	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -2

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PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 2

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
1,3-DICHLORO-2-PROPANOL	<100	ug/l
cis-1,3-DICHLOROPROPENE	<5.0	ug/l
trans-1,3-DICHLOROPROPENE	<5.0	ug/l
1,2:3,4-DIEPOXYBUTANE	<100	ug/l
1,4-DIOXANE	<100	ug/l
ETHYLBENZENE	<5.0	ug/l
ETHYLENE OXIDE	<100	ug/l
ETHYL METHACRYLATE	<5.0	ug/l
2-HEXANONE	<50.0	ug/l
IODOMETHANE	<5.0	ug/l
ISOBUTYL ALCOHOL	<100	ug/l
MALONONITRILE	<100	ug/l
METHACRYLONITRILE	<100	ug/l
METHYLENE CHLORIDE	<5.0	ug/l
METHYL IODIDE	<5.0	ug/l
METHYL METHACRYLATE	<5.0	ug/l
4-METHYL-2-PENTANONE	<50.0	ug/l
2-PICOLINE	<100	ug/l
PROPARGYL ALCOHOL	<100	ug/l
b-PROPIOLACTONE	<100	ug/l
PROPIONITRILE	<100	ug/l
n-PROPYLAMINE	<100	ug/l
STYRENE	<5.0	ug/l
1,1,1,2-TETRACHLOROETHANE	<5.0	ug/l
1,1,2,2-TETRACHLOROETHANE	<5.0	ug/l
TETRACHLOROETHENE	<5.0	ug/l
TOLUENE	<5.0	ug/l
1,1,1-TRICHLOROETHANE	<5.0	ug/l
1,1,2-TRICHLOROETHANE	<5.0	ug/l
TRICHLOROETHENE	<5.0	ug/l
TRICHLOROFLUOROMETHANE	<5.0	ug/l
1,2,3-TRICHLOROPROPANE	<5.0	ug/l
VINYL ACETATE	<50.0	ug/l

REMARKS:
ELAP# 10224
107780 -2

JOHN PEDNEAULT
LABORATORY DIRECTOR

PEDNEAULT ASSOCIATES, INC. TESTING LABORATORIES
1615 NINTH AVENUE • P.O. BOX 205 • BOHEMIA, N.Y. 11716 • (516) 467-8477
FAX: (516) 467-6905 After 5pm: (516) 567-5579

BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 2

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
VINYL CHLORIDE	<10.0	ug/l
XYLENE (TOTAL)	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -2

JOHN PEDNEAULT
LABORATORY DIRECTOR

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FAX: (516) 467-6905 After 5pm: (516) 567-5579

BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 3

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
ACETONE	26.9	ug/l
ACETONITRILE	<100	ug/l
ACROLEIN	<100	ug/l
ACRYLONITRILE	<100	ug/l
ALLYL ALCOHOL	<100	ug/l
ALLYL CHLORIDE	<5.0	ug/l
BENZENE	<5.0	ug/l
BENZYL CHLORIDE	<100	ug/l
BROMOACETONE	<100	ug/l
BROMODICHLOROMETHANE	<5.0	ug/l
BROMOFORM	<5.0	ug/l
BROMOMETHANE	<10.0	ug/l
2-BUTANONE	<100	ug/l
CARBON DISULFIDE	<5.0	ug/l
CARBON TETRACHLORIDE	<5.0	ug/l
CHLOROBENZENE	<5.0	ug/l
CHLORODIBROMOMETHANE	<5.0	ug/l
CHLOROETHANE	<10.0	ug/l
2-CHLOROETHANOL	<100	ug/l
2-CHLOROETHYL VINYL ETHER	<10.0	ug/l
CHLOROFORM	<5.0	ug/l
CHLOROMETHANE	<10.0	ug/l
CHLOROPRENE	<5.0	ug/l
1,2-DIBROMO-3-CHLOROPROPANE	<100	ug/l
1,2-DIBROMOETHANE	<5.0	ug/l
DIBROMOMETHANE	<5.0	ug/l
1,4-DICHLORO-2-BUTENE	<100	ug/l
DICHLORODIFLUOROMETHANE	<5.0	ug/l
1,1-DICHLOROETHANE	<5.0	ug/l
1,2-DICHLOROETHANE	<5.0	ug/l
1,1-DICHLOROETHENE	<5.0	ug/l
trans-1,2-DICHLOROETHENE	<5.0	ug/l
1,2-DICHLOROPROPANE	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -3

JOHN PEDNEAULT
LABORATORY DIRECTOR

PEDNEAULT ASSOCIATES, INC. TESTING LABORATORIES
1615 NINTH AVENUE • P.O. BOX 205 • BOHEMIA, N.Y. 11716 • (516) 467-8477
FAX: (516) 467-6905 After 5pm: (516) 567-5579

BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 3

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
1,3-DICHLORO-2-PROPANOL	<100	ug/l
cis-1,3-DICHLOROPROPENE	<5.0	ug/l
trans-1,3-DICHLOROPROPENE	<5.0	ug/l
1,2:3,4-DIEPOXYBUTANE	<100	ug/l
1,4-DIOXANE	<100	ug/l
ETHYLBENZENE	<5.0	ug/l
ETHYLENE OXIDE	<100	ug/l
ETHYL METHACRYLATE	<5.0	ug/l
2-HEXANONE	<50.0	ug/l
IODOMETHANE	<5.0	ug/l
ISOBUTYL ALCOHOL	<100	ug/l
MALONONITRILE	<100	ug/l
METHACRYLONITRILE	<100	ug/l
METHYLENE CHLORIDE	70.0	ug/l
METHYL IODIDE	<5.0	ug/l
METHYL METHACRYLATE	<5.0	ug/l
4-METHYL-2-PENTANONE	<50.0	ug/l
2-PICOLINE	<100	ug/l
PROPARGYL ALCOHOL	<100	ug/l
b-PROPIOLACTONE	<100	ug/l
PROPIONITRILE	<100	ug/l
n-PROPYLAMINE	<100	ug/l
STYRENE	<5.0	ug/l
1,1,1,2-TETRACHLOROETHANE	<5.0	ug/l
1,1,2,2-TETRACHLOROETHANE	<5.0	ug/l
TETRACHLOROETHENE	<5.0	ug/l
TOLUENE	<5.0	ug/l
1,1,1-TRICHLOROETHANE	<5.0	ug/l
1,1,2-TRICHLOROETHANE	<5.0	ug/l
TRICHLOROETHENE	<5.0	ug/l
TRICHLOROFLUOROMETHANE	<5.0	ug/l
1,2,3-TRICHLOROPROPANE	<5.0	ug/l
VINYL ACETATE	<50.0	ug/l

REMARKS:
ELAP# 10224
107780 -3

JOHN PEDNEAULT
LABORATORY DIRECTOR

PEDNEAULT ASSOCIATES, INC. TESTING LABORATORIES
1615 NINTH AVENUE • P.O. BOX 205 • BOHEMIA, N.Y. 11716 • (516) 467-8477
FAX: (516) 467-6905 After 5pm: (516) 567-5579

BERNINGER ENVIRONMENTAL

1615 NINTH AVENUE-P.O. BOX 205
BOHEMIA, NY 11716-0000 (516)588-2251

PROJECT ID: STAR SAND & GRAVEL, KINGS POINT, NY

LAB NUMBER: 107780 **MATRIX:** LIQUID
SAMPLE ORIGIN: MW 3

COLLECTION DATE:	RECEIPT DATE:	ANALYSIS DATE:	REPORT DATE:
9/25/95	9/25/95	10/02/95	10/06/95

GC/MS FOR VOLATILE ORGANICS
EPA8240

PARAMETER	RESULTS	UNIT
VINYL CHLORIDE	<10.0	ug/l
XYLENE (TOTAL)	<5.0	ug/l

REMARKS:
ELAP# 10224
107780 -3

JOHN PEDNEAULT
LABORATORY DIRECTOR

REFERENCE NO. 4

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

APPLICATION FOR APPROVAL TO OPERATE A SOLID WASTE MANAGEMENT FACILITY

Appendix VI-A

PROJECT NO. 52-S-24 | 11/9/78

DEPARTMENT ACTION ☐ Approved ☐ Disapproved | DATE Pisi

EE APPLICATION INSTRUCTIONS ON REVERSE SIDE

1. OWNER'S NAME: Star Sand & Gravel Corp.
2. ADDRESS (Street, City, State, Zip Code): Lawrence Road Kings Pk. N.Y.
3. Telephone No.: 269-9728
4. OPERATOR'S NAME: Thomas Gesuale
5. ADDRESS (Street, City, State, Zip Code): 36 Landview Dr. Dix Hills, N.Y.
6. Telephone No.: 271-4754
7. ENGINEER'S NAME: Thomas A. Gesuale
8. ADDRESS (Street, City, State, Zip Code): 36 Landview Dr. Dix Hills, Ny.
9. Telephone No.: 271-4754
10. ON-SITE SUPERVISOR: John Gesuale
11. ADDRESS (Street, City, State, Zip Code): " " " "
12. Telephone No.: " "

13. HAS THE INDIVIDUAL NAMED IN ITEM 10 ATTENDED A DEPARTMENT SPONSORED OR APPROVED TRAINING COURSE?
☐ Yes Date Course Title Location Not yet ☐ No

14. PROJECT/FACILITY NAME: Star Sand & Gravel Corp.
15. COUNTY IN WHICH FACILITY IS LOCATED: Suffolk
16. ENVIRONMENTAL CONSERVATION REGION: # 1

17. TYPE OF PROJECT FACILITIES: ☐ Composting ☐ Transfer ☐ Shredding ☐ Baling ☑ Sanitary Landfill ☐ Incineration ☐ Pyrolysis
☐ Resource Recovery-Energy ☐ Resource Recovery-Materials ☐ Other

18. HAS THIS DEPARTMENT EVER APPROVED PLANS AND SPECIFICATIONS AND/OR ENGINEERING REPORTS FOR THIS FACILITY? ☐ Yes Date ☑ No

19. LIST WASTES NOT ACCEPTED

20. BRIEFLY DESCRIBE OPERATION

Demolition debris consisting of concrete, brick, block, Asphalt, will be brought to site by dump Trucks, is Compacting ~~will~~ before with a D8 Caterpillar Bulldozer, then covered with Topsoil, And seeded with Rye.

RECEIVED
NOV 17 1978
BUREAU OF MANAGEMENT PROGRAMS

Received from NYDEC Bureau of Landfills

21. IF FACILITY IS A SANITARY LANDFILL, PROVIDE THE FOLLOWING INFORMATION:
a. Total useable area: (Acres) Initially _____ Currently _____
b. Distance to nearest offsite, downgradient, water supply well _____ Feet
c. No. of groundwater monitoring wells Upgradient _____ Downgradient _____

22. INDICATE WHICH ATTACHMENTS, IF ANY, ARE INCLUDED WITH THIS APPLICATION:
☐ Form 47-19-2 or SW-7 ☐ Operations Plan & Report ☐ USGS Topographic Map ☐ Record Forms ☐ Other
☐ Construction Certificate ☐ Boring Logs ☐ Water Sample Analysis ☐ None

23. CERTIFICATION:
I hereby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Date _____ Signature and Title _____

47-19-4 (6/77)
Formerly SW-22

CENTRAL OFFICE COPY

REFERENCE NO. 5

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE 1 INVESTIGATION
Star Sand and Gravel Corp.
Site No. 152097
Town of Smithtown, Suffolk County
Final - June 1987

New York State
Department of
Environmental Conservation

50 Wolf Road, Albany, New York 12233
Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste
Norman H. Nosenchuck, P.E., Director

Prepared by:

EA SCIENCE AND TECHNOLOGY
A Division of EA Engineering, Science, and Technology, Inc.

EA REPORT DEC63A

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK PHASE I INVESTIGATIONS

STAR SAND AND GRAVEL CORP.
TOWN OF SMITHTOWN, SUFFOLK COUNTY
NEW YORK I.D. NO. 152097

Prepared for

Division of Solid and Hazardous Waste
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-0001

Prepared by

EA Science and Technology
R.D. 2, Goshen Turnpike
Middletown, New York 10940

A Division of EA Engineering, Science, and Technology, Inc.

June 1987

CONTENTS

REFERENCE NO. 6

Appendix 1.1-9

COUNTY OF SUFFOLK

PETER F. COHALAN
SUFFOLK COUNTY EXECUTIVE

DEPARTMENT OF HEALTH SERVICES

May 19, 1983

Mr. Thomas Gesuale
Star Sand and Gravel
Kings Park, New York

Re: Odor Complaints from Adjacent Areas

Dear Mr. Gesuale:

In the past few weeks this office has received complaints concerning odors originating from your property. An inspection conducted on 5/12/83 disclosed that there was a putrescible odor noted in your land fill material. These odors might indicate the disposal of organic materials currently decomposing. In light of your facility's potential to create an odor in new adjacent areas, you are asked to cover the entire facility including all exposed slopes. This practice must continue throughout the operating year unless you restrict materials prone to decomposition. Failure to comply within 10 working days will leave this office no alternative but to refer the matter to New York State DEC Regional Solid Waste Authority.

Very truly yours,

Steven Kramer
Assistant Public Health Engineer

SK/lc
cc: J. Heil

15 HORSEBLOCK PLACE • FARMINGVILLE, NEW YORK 11738 • (516) 451-4633

REFERENCE NO. 7

15 (12/75)

Appendix 1.1-7

New York State Department of Environmental Conse...

MEMORANDUM

Received from NYSDEC Region ...

TO: Lt. Huss/Capt. Otterstedt

FROM: ECO Kelly

SUBJECT: Follow-up Inspections, Steck & Philbin, Northeast Mines and Starr Sand & Gravel Demolition Debris Landfill Sites

DATE: June 21, 1984

On this date, Bob Becherer, Solid Waste, Lt. Huss, ECO Johnston and I made follow-up inspections of the above referenced demolition debris landfill sites. Weather conditions were clear, windy and cool, winds out of northwest.

At approximately 4:15 a.m., Starr Sand & Gravel was checked. Gates were open and a tractor-box trailer vehicle marked "Damco" was parked outside. This vehicle bore New Jersey commercial XD99YH (Tractor) and New Jersey Trailer TD323Y. A passenger vehicle bearing registration number 7415 AVT operated by a white female left the yard at this time. At approximately 7 a.m. this site was checked again. The above tractor-trailer vehicle was observed to be carrying a load of new insulation. We spoke to Mr. Thomas Gesuale, who stated that the Advanced Insulation Company rented space at this site. Inside, 10 additional trailers were observed containing insulation materials. Two workers were offloading insulation materials from a trailer onto a truck bearing New York Reg. 42781GL. The demolition debris area was inspected; there was a large amount of permitted materials, mostly concrete and tree stumps and branches present. There were no trucks dumping at this time. Mr. Gesuale stated that the materials resulted from his company's activities. Although permitted materials were found, there was no daily cover as required by 360.8(b).

At approximately 4:30 a.m., Steck and Philbin Northeast Mines was checked. The perimeter fence was found to be knocked down. Uncovered demolition debris material was observed. The facility gates were closed and several trucks were lined up along Old Northport Road.

At about 5:15 a.m., we entered the site and spoke to Joe Rizzo, site supervisor. Mr. Becherer inspected a truck and found a small amount of paper in the load. Mr. Rizzo was advised of the permit requirements that prohibits the disposal of paper at this site. After some discussion, it was decided that trucks could dump their loads, and any paper would be separated and trucked to the town landfill. Mr. Rizzo was provided a copy of the Part 360 permit with the special conditions so that he could become fully aware of the permit requirements. We left the site at approximately 7:00 a.m.

al

cc: B. Becherer, Solid Waste

REFERENCE NO. 8

Appendix 1.1-10

Received from
NYSDEC Region 1

COMPLIANCE CONFERENCE
STAR SAND & GRAVEL
January 3, 1984

Star Sand & Gravel operates a permitted construction and demolition debris landfill in Kings Park.

On June 22, 1983, a Compliance Conference (Thomas Gezuale) was held. The violation was disposal of non-inert material. The Conference resulted in Star agreeing to:

--perform a methane survey because of odors;

--install two groundwater monitoring wells;

--sample the two wells and an existing third;

--restrict landfilling operations to daylight hours.

A final consent order was not prepared pending groundwater monitoring results. Since that time, Star has:

--performed the methane survey;

--installed the wells;

--probably restricted operations.

The wells have not been sampled. A list of constituents was given to Star. After a several week period, he indicated he did not receive the list. It was sent again. Next issue was the cost ($1,200). The number of constituents was decreased. New cost obtained was approximately $900. Next issue was if State and County were going to sample; we could pump the wells and he could sample. Two years ago, Solid Waste informed Star the State would sample and analyze water. Sampling program would be developed based on this data.

In the interim, Suffolk Health has certified that Star is a source of odors (see attached documentation).

Recommendations

--have Star agree to routine water monitoring program;

--discuss odor remediation with J. Maloney.

dm
1/4/84

REFERENCE NO. 9

Received from:
Suffolk Co. Dept. of
Health

Appendix 1.1-20

HOLZMACHER, McLENDON and MURRELL, P.C • CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS and PLANNERS
375 FULTON STREET, FARMINGDALE, N.Y. 11735 • 516-694-3410

July 22, 1983

RECEIVED
JUL 28 1983
SUFFOLK COUNTY
JOB NO.

Mr. Thomas Gesuale
Star Sand & Gravel Corp.
36 Landview Drive
Dix Hills, NY 11746

Dear Tom:

As per your authorization of July 19, 1983, and the New York State Department of Environmental Conservation's (DEC) correspondence of July 7, 1983 (Item 2), H2M sampled explosive gas concentrations at your landfill on July 20, 1983. The explosive gas concentrations were measured three feet below ground level on 50 foot centers (modified from DEC's suggested 25 foot centers as agreed to by James H. Heil of DEC, July 18, 1983) across the entire landfill face and perimeter.

H2M's technician measured combustible gas levels (expressed as percent methane) in soil probes three feet deep. The J-W Gas Pointer, Model H (Bacharach) can detect methane gas in two sensitivity ranges as follows:

1. Zero to four percent. Sensitivity is approximately ± 0.5 percent.

2. Zero to 100 percent. Sensitivity is approximately ± 2.0 percent.

The instrument was calibrated to a one percent methane gas standard approximately every two hours in the field.

Results from the 31 points sampled are indicated on the enclosed figure and were as follows:

1. No methane was discovered at 26 of the sampling locations.

2. Four points located at the northeast corner, southeast corner, northeast interior and southwest interior of the fill demonstrated traces of methane. A trace is less than one-half percent.

3. One sampling point on the northwest corner of the fill showed a fire vent approximately two feet in length. The vent was actively smoking, contained two percent methane and contained yellowish (presumably sulfur) deposits.

These results indicate that the majority of the landfill is not currently venting methane. The trace amounts of methane detected were widely spaced, irregular in occurrence, and so, not indicative of any serious methane problems.

The fire vent is, however, indicative of a very serious problem. Currently, a smoldering fire is working its way through combustible portions of the fill on its northwest corner. The fill in this location is relatively new and so the fire has probably not progressed very far. The odors which prompted the current landfill inspection are released from this vent and are most probably the result of incomplete combustion releasing reduced sulfur compounds (i.e., H_2S) to the atmosphere. This conclusion is supported by sulfur deposits found at the fire vent.

The recommended remedial action for this problem is as follows:

1. As per your request, H2M has already contacted Jim Heil (DEC) to describe the problem to him. He will be contacting you to inspect the vent.

2. Contact the local fire department to inform them of the problem and proposed remedial action. Ask whether or not they wish to be present when action is taken.

3. Dig out the smoldering material and spread it on an open surface on top of covered fill. Water the material down until it is completely soaked through and cold. Once you are sure the material is out, cover it with sand or other inert cover materials.

If you have any questions, please do not hesitate to contact me.

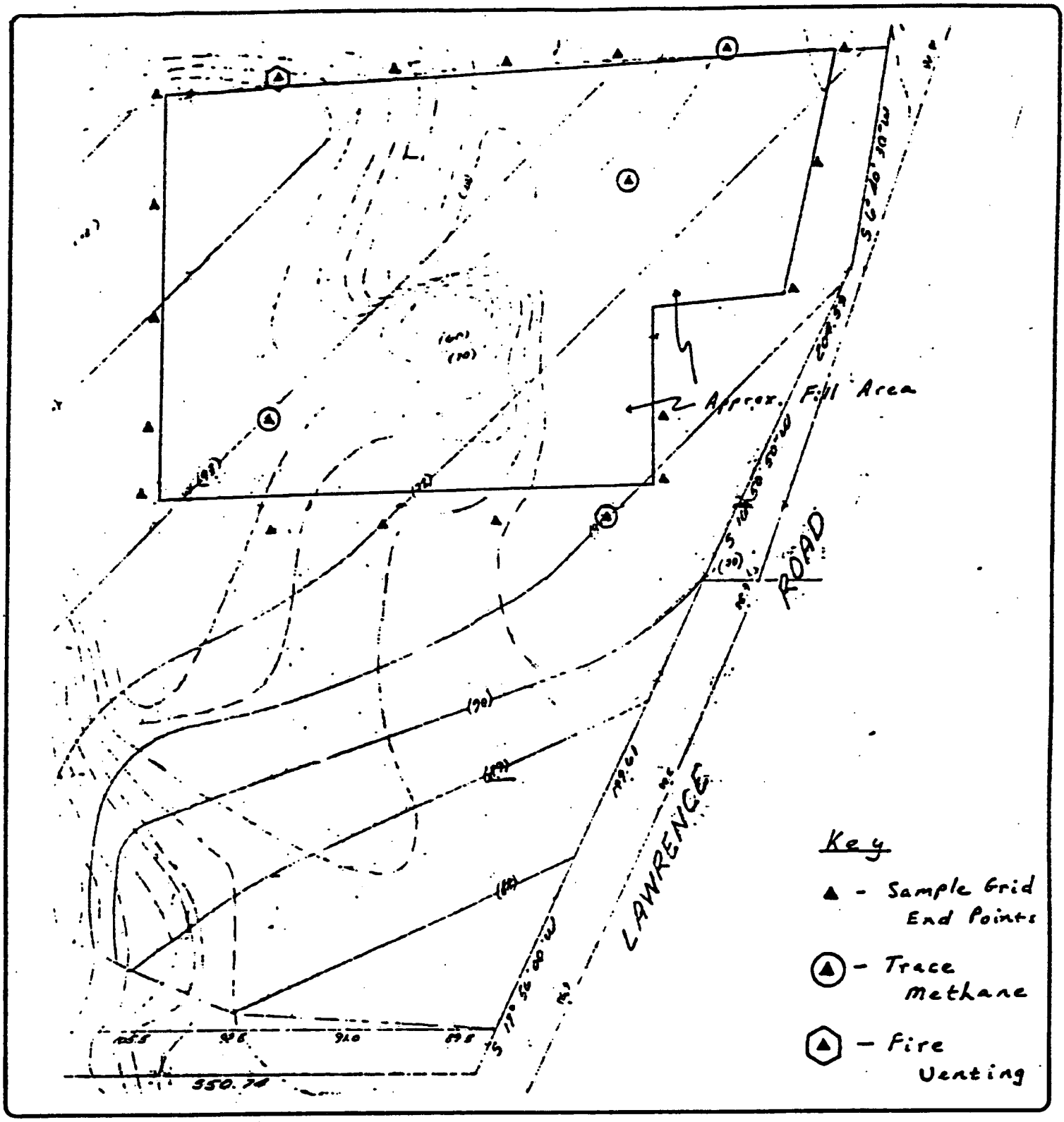
Yours truly,

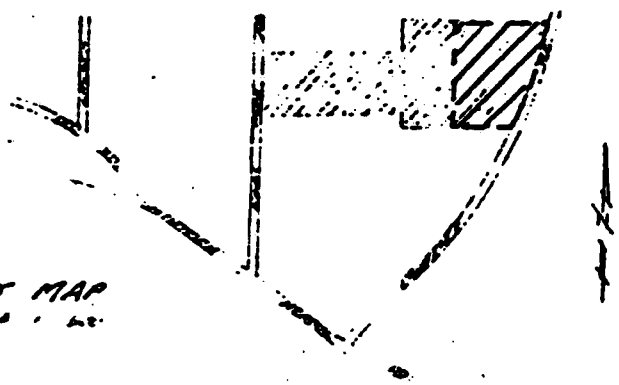
HOLZMACHER, McLENDON & MURRELL, P.C.

Michael P. Bontje

MPB:rms
Enclosures

cc: J. Heil, P.E. NYSDEC
J. Maloney, P.E. SCDHS ← This Copy for





Date	Figure 1	Sheet 1 of 1
July 20, 1983	Star Sand + Gravel	
Scale in Feet 1" = 62'	Methane Study	

H2M HOLZMACHER, McLENDON & MURRELL, P.C.
CONSULTING ENGINEERS ENVIRONMENTAL SCIENTISTS and PLANNERS

REFERENCE NO. 10

New York State Department of Environmental Conservation
Building 40, SUNY, Stony Brook, NY 11794
(516) 751-7900

Henry G. Williams
Commissioner

SUFFOLK COUNTY
JOB NO._____

August 24, 1983

Mr. Thomas Gesuale
Star Sand & Gravel Inc.
36 Landview Drive
Dix Hills, NY 11746

Dear Mr. Gesuale:

We understand that the two groundwater monitoring wells have been installed as per the agreement at the Department's Compliance Conference.

The well drillers completion reports showing total depth and depth into groundwater should be submitted to this office.

Sampling of the wells including the site water supply well should be sampled as soon as possible. The sampling should be performed by representatives of a State approved analytical laboratory such as H2M Corp., Eco Test, New York Testing or Volumetric Techniques. Sampling should follow standard procedures involving complete evacuation of the well to insure a fresh sample is taken. A list of the analytical constituents is attached.

Please notify this office at least two days in advance of the sampling so we can arrange for our own samples.

Very truly yours,

James H. Heil/ebp

JAMES H. HEIL, P.E.
Regional Solid Waste Engineer

JHH:ebp
cc: J. Scherb
J. Maloney, SCDHS ✓

CONSTITUENTS FOR SAMPLING OF MONITORING WELLS
STAF SAND & GRAVEL

methylene chloride
carbon tetrachloride
trichloroethylene
1,1,1 trichloromethane
toluene

tetrachloroethylene
trichloroethane
vinyl chloride
benzene
xylene

Ph
chloride
hardness
T. alkalivity

chromium, total
sulfate
hydrogen sulfide
cadmium
lead

3 wells

REFERENCE NO. 11

Appendix 1.1-21

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
HAUPPAUGE, NEW YORK

Received from:
Suffolk Co. Dept. of
Health

RECEIVED
OCT 1 1983

SUFFOLK COUNTY
JOB NO._____

TO: James Maloney

FROM: Dennis Moran
Drinking Water Section DM

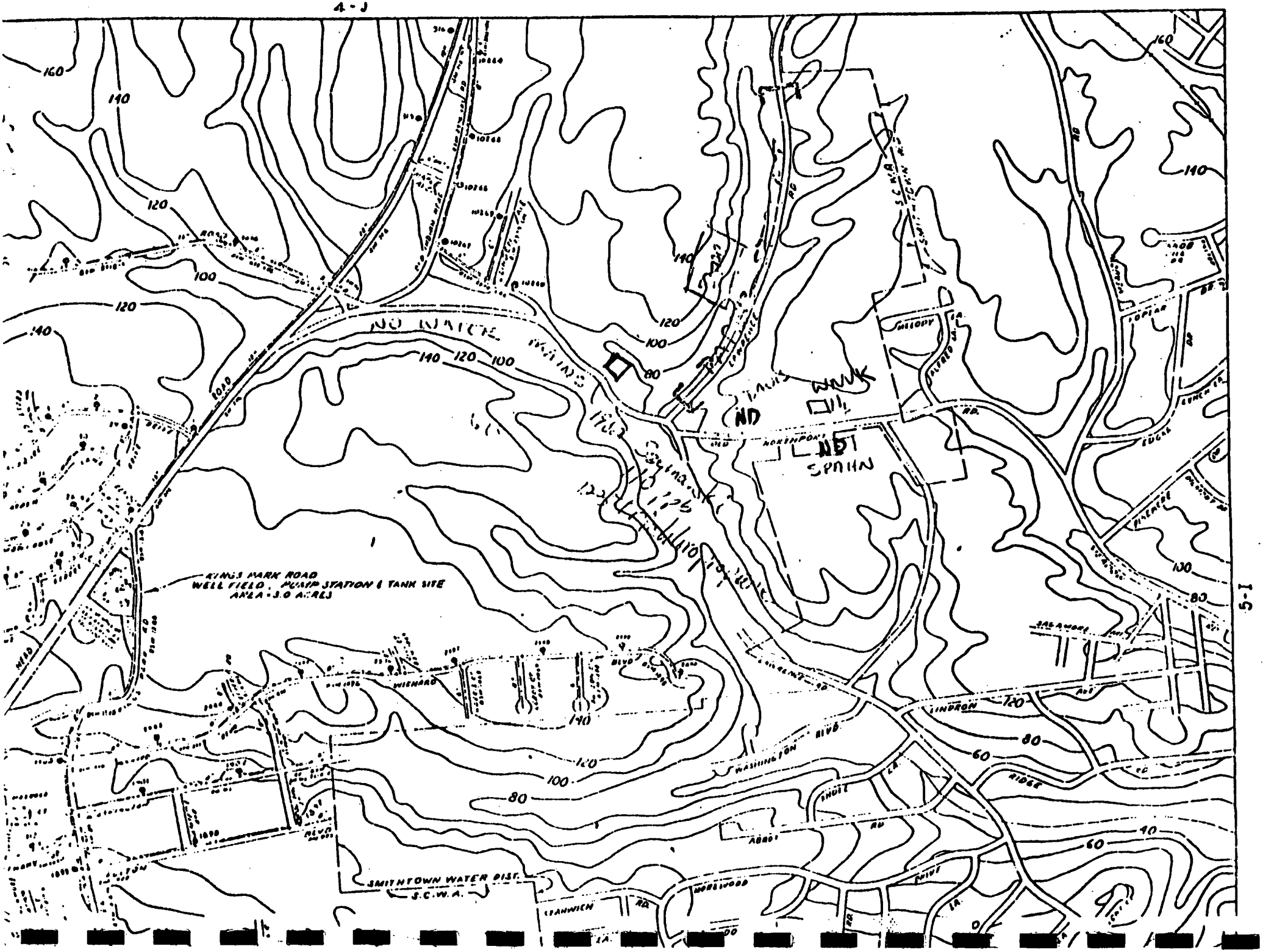
DATE: September 23, 1983

SUBJECT: Star Sand & Gravel

Attached hereto, as requested, are copies of sample results for private wells near Star Sand & Gravel.

Should you have any questions, feel free to give me a call.

DM/jdm
Att.


4-J
160
140
120
100
80
60
40
NO WATER MAINS
KINGS PARK ROAD
WELL FIELD, PUMP STATION & TANK SITE
AREA - 3.0 ACRES
SMITHTOWN WATER DIST.
S.C.W.A.
NORTHPORT
SPRING
WASHINGTON BLVD
5-1

Field No. 1010
Date 6-20-83
Time AM
Col. By VERYZER

Type Water ✓
Other
Date Received
Examined By

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
DIVISION OF [illegible] & FORENSIC SCIENCES
PUBLIC HEALTH LABORATORY

SURVEY

TRACE ORGANIC ANALYSIS OF WATER

Name MR. & MRS. SPAHN Owner or Distributor
Location 35 OLD NORTHPORT RD., KINGS PARK
Point of Collection KT.
Remarks: SMALL BOTTLE.

	Compound	ppb
306	Vinyl Chloride	<3
305	Methylene Chloride	<2
290	Bromochloromethane	<2
323	1,1 Dichloroethane	<2
309	Trans Dichloroethylene	<2
300	Chloroform	<2
324	1,2 Dichloroethane	<2
321	1,1,1 Trichloroethane	<2
304	Carbon Tetrachloride	<2
294	1 Bromo-2-Chloroethane	<2
405	1,2 Dichloropropane	<2
310	1,1,2 Trichloroethylene	<2
303	Chlorodibromomethane	<2
293	1,2 Dibromoethane	<2
420	2 Bromo-1-Chloropropane	<2
301	Bromoform	<2
311	Tetrachloroethylene	<2
308	Cis Dichloroethylene	<2
320	Freon 113	<2
292	Dibromomethane	<2
307	1,1 Dichloroethylene	<2
302	Bromodichloromethane	<2
429	1,3 Dichloropropene	—
	Cis Dichloropropene	<2
	Trans Dichloropropene	<2

	Compound	ppb
250	Benzene	<3
251	Toluene	<3
254	o-Xylene	<3
252	m-Xylene	<3
253	p-Xylene	<3
255	Xylene (s)	—
258	Chlorobenzene	<3
259	Ethylbenzene	<3
257	Bromobenzene	<11
256	o-Chlorotoluene	<3
267	m-Chlorotoluene	<3
268	p-Chlorotoluene	<3
265	Chlorotoluene (s)	—
419	1,3,5 Trimethylbenzene	<3
418	1,2,4 Trimethylbenzene	<3
415	m,p-Dichlorobenzene	<4
412	o-Dichlorobenzene	<4
	p-Diethylbenzene	<3
	1,2,4,5 Tetramethylbenzene	<3
406	2,3 Dichloropropene	<2
322	1,1,2 Trichloroethane	<2
409	1,1,2,2 Tetrachloroethane	<2
	1,2,3,5 Tetrachloropropane	<2
295	s-Tetrachloroethane	—
	1,1,1,2 Tetrachloropropane	<2
	1,2,3 Trichloropropane	<2

Lab No.
Field No. 1011
Date 6-26-83
Time AM
Col. By VERYZER

Priv. Water ✓
Other
Date Collected 1-17-83
Examined By [illegible]

SUFFOLK COUNTY DEPARTMENT OF HEALTH SERVICES
DIVISION OF [illegible] & TOXIC SUBSTANCES
PUBLIC HEALTH LABORATORY

TRACE ORGANIC ANALYSIS OF WATER

Name BILL DAVIS Owner or Distributor
Location 42 OLD NORTHPORT RD., KINGSPARK
Point of Collection O.T.
Remarks: SMALL BOTTLE

No.	Compound	ppb
306	Vinyl Chloride	<3
305	Methylene Chloride	<2
290	Bromochloromethane	<2
323	1,1 Dichloroethane	<2
309	Trans Dichloroethylene	<2
300	Chloroform	<2
324	1,2 Dichloroethane	<2
321	1,1,1 Trichloroethane	<2
304	Carbon Tetrachloride	<2
294	1 Bromo-2-Chloroethane	<2
405	1,2 Dichloropropane	<2
310	1,1,2 Trichloroethylene	<2
303	Chlorodibromomethane	<2
293	1,2 Dibromoethane	<2
420	2 Bromo-1-Chloropropane	<2
301	Bromoform	<2
311	Tetrachloroethylene	<2
308	Cis Dichloroethylene	<2
320	Freon 113	<2
292	Dibromomethane	<2
307	1,1 Dichloroethylene	<2
302	Bromodichloromethane	<2
429	1,3 Dichloropropane	—
	Cis Dichloropropene	<2
	Trans Dichloropropene	<2

No.	Compound	ppb
250	Benzene	<3
251	Toluene	<3
254	o-Xylene	<3
252	p-Xylene	<3
253	m-Xylene	<3
255	Xylene (s)	—
258	Chlorobenzene	<3
259	Ethylbenzene	<3
257	Bromobenzene	<4
256	o-Chlorotoluene	<3
267	m-Chlorotoluene	<3
268	p-Chlorotoluene	<3
265	Chlorotoluene (s)	—
419	1,3,5 Trimethylbenzene	<3
418	1,2,4 Trimethylbenzene	<3
415	m,p-Dichlorobenzene	<4
412	o-Dichlorobenzene	<4
	p-Diethylbenzene	<3
	1,2,4,5 Tetramethylbenzene	<3
406	2,3 Dichloropropene	<2
322	1,1,2 Trichloroethane	<2
409	1,1,1,2 Tetrachloroethane	<2
	1,2,3,3 Tetrachloropropane	<2
295	s-Tetrachloroethane	—
	1,1,1,2 Tetrachloropropane	<2
	1,2,3 Trichloropropane	<2

REFERENCE NO. 12

December 13, 1982

Mr. Dan Szymanski
32 Old Northport Road
Kings Park, NY 11754

RE: WATER SAMPLE
10-14-82

Dear Mr. Szymanski:

In reference to our correspondence of October 29, 1982, after expending considerable effort, our laboratory has been able to identify the contaminant present in your well water as 1,2,3 trichloropropane.

The analysis revealed a concentration of 110 parts per billion 1,2,3 trichloropropane at the time of sampling. This synthetic organic compound is in the general category of substances having a maximum acceptable concentration of 50 ppb in drinking water.

We reiterate our original recommendation that the water not be used for consumptive purposes and that an alternate source of water be obtained. This department suggests connection to a public water supply wherever possible. Should you have any questions, feel free to contact this office.

Very truly yours,

Martin Trent
Senior Sanitarian

MT/jb

REFERENCE NO. 13

COUNTY OF SUFFOLK

DEPARTMENT OF HEALTH SERVICES

October 29, 1982

Re: Water Samples - 9/27/82
10/14/82

Mr. Dan Szymanski
32 Old Northport Road
Kings Park, N.Y. 11754

Dear Mr. Szymanski:

Analyses of samples of your water supply have been completed. The results indicate at the time of sampling iron exceeded the recommended standard.

Excess iron is not normally considered harmful to health, but may cause taste, odor and staining problems. Your water supply contained 6.67 mg/l iron. The drinking water standard for iron is 0.3 mg/l.

In addition, concentrations of an unidentified volatile organic compound were detected. Although our laboratory was unable to specifically identify the compound, if quantified as tetrachloroethylene, the concentration would exceed 200 parts per billion. The presence of this compound was confirmed in both samples collected at your home. As a result of this finding, it is recommended your water supply not be used for drinking or cooking purposes.

The Department of Health Services recommends connection to the public water supply wherever possible. Should you have any questions, feel free to call this office.

Very truly yours,

Martin Trent, Sr. Sanitarian
Drinking Water Supply Section

MT/jdm

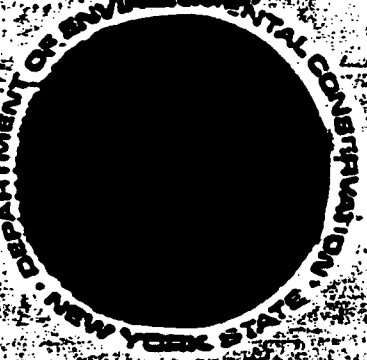
225 RABRO DRIVE EAST • HAUPPAUGE, N.Y. 11787 • (516) 435-291

REFERENCE NO. 14

ENGINEERING INVESTIGATION OF INACTIVE HAZARDOUS WASTE SITES

- PHASE II INVESTIGATIONS -

Star Sand and Gravel Corporation
Site No: 152097
Town of Smithtown, Suffolk County
Final - January 1992



Prepared for:
New York State
Department of
Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010
Thomas C. Jorling, Commissioner

Division of Hazardous Waste Remediation
Michael J. O'Toole Jr., P.E., Director

Prepared by:
ROUX ASSOCIATES, INC.
775 Park Avenue
Huntington, New York 11743

Subcontractor to:
Gibbs & Hill, Inc.
New York, New York

ROUX

GH07708Y.1.17

ENGINEERING INVESTIGATION OF INACTIVE HAZARDOUS WASTE SITES

- PHASE II INVESTIGATIONS -

Star Sand and Gravel Corporation
Site No: 152097
Town of Smithtown, Suffolk County
Final - January 1992

Prepared for:
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Huntington, New York 11743

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New York, New York

ROUX

GH07708Y.1.17

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TABLES

FIGURES

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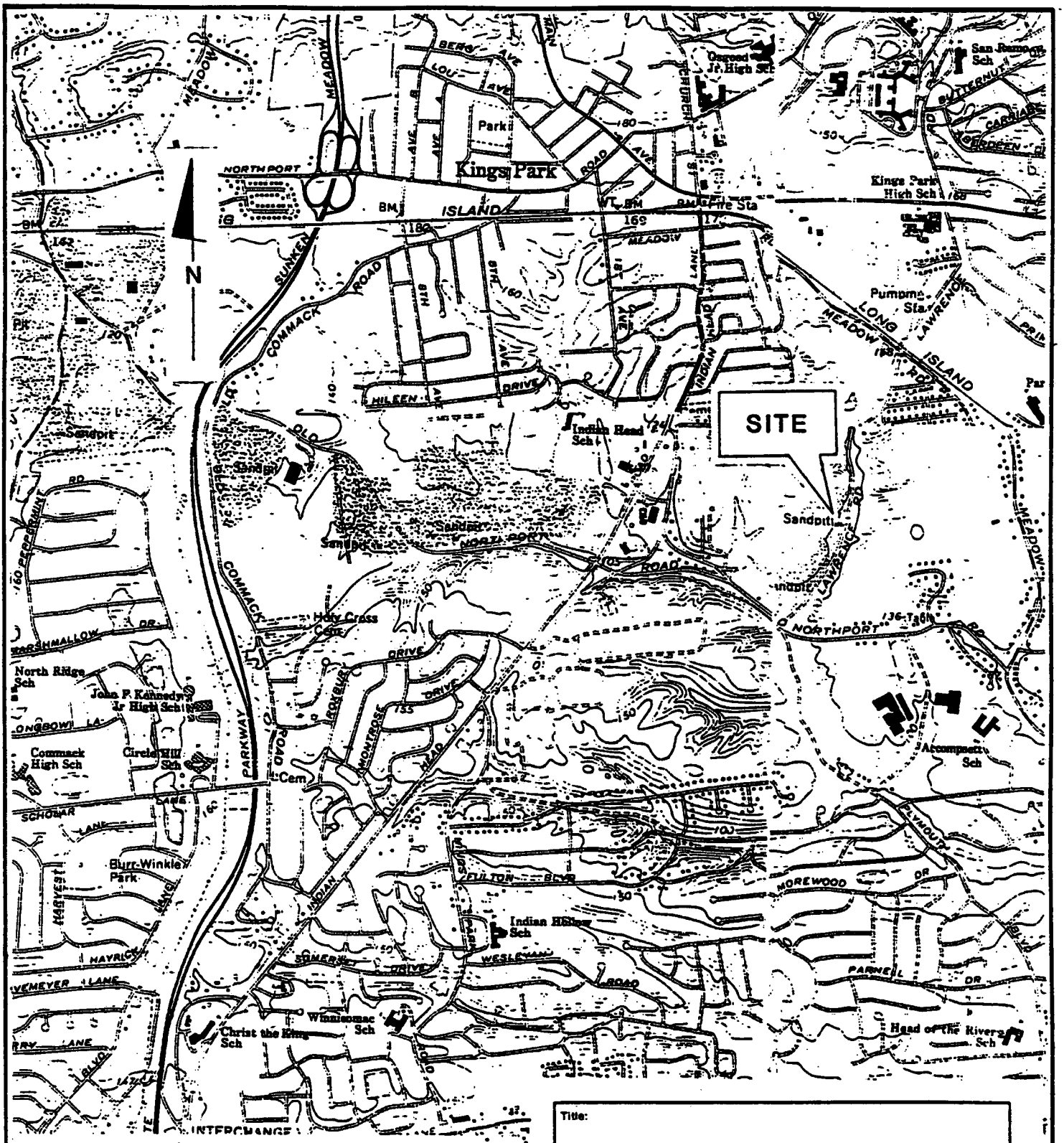


REFERENCE: USGS SAINT JAMES, CENTRAL ISLIP, NORTHPORT & GREENLAWN QUADRANGLE 7.5 MINUTE SERIES (TOPOGRAPHIC)

Title:

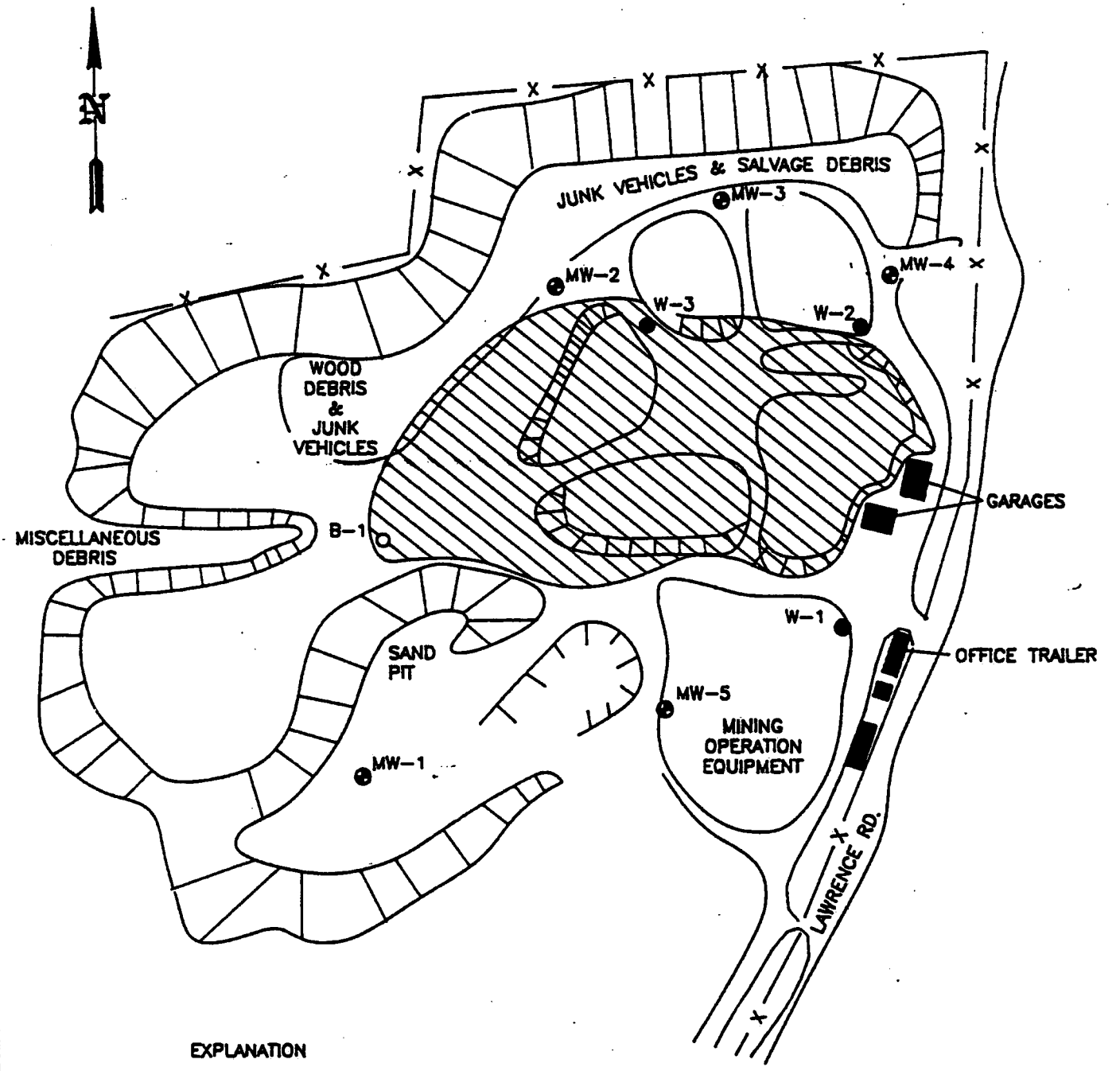
LOCATION OF SITE

Prepared for:

GIBBS & HILL

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers

Compiled by: E. A.	Date: 6/90	Figure 1
Prepared by: V. M.	Scale: 1"=2000'	
Project Mgr: J. W.	Revision: 0	
File No: 07709Y		



EXPLANATION

- B-1 ○ LOCATION AND DESIGNATION OF SOIL SAMPLE
- W-1 ● PRE-EXISTING WELL LOCATION AND DESIGNATION
- MW-1 ⊕ SAMPLE MONITORING WELL LOCATION AND DESIGNATION
- LANDFILL AREA
- SLOPED PORTION OF SITE
- —X— CHAIN LINK FENCE
- ACCESS ROADS

0 200 400 FT.

Title:

STAR SAND AND GRAVEL CORPORATION SITE

Prepared For: GIBBS & HILL

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: E.A.	Date: 8/91	PLATE 2
Prepared by: S.W.	Scale: SHOWN	
Project Mgr: J.W.	Revision: 1	
File No: GH708A01		

1.0 EXECUTIVE SUMMARY

Roux Associates, Inc. (Roux Associates) was subcontracted by Gibbs & Hill Inc. to conduct a Phase II investigation at the Star Sand & Gravel Corporation site (ID No. 152097) for the New York State Department of Environmental Conservation (NYSDEC). A Phase II Work Plan Update prepared by Roux Associates was submitted to the NYSDEC in August of 1990, and approved. This report presents the results of the Phase II investigation.

The Star Sand & Gravel Corporation site (Site), located in the Town of Smithtown, Suffolk County, New York (Figure 1) is currently owned by Mr. Thomas Gesuale of Dix Hills, New York and consists of a 40-acre sand mine, 3-acres of which has reportedly been used as a landfill for construction and demolition debris.

As a result of several inspections and of complaints from residents, two consent orders have been issued by the NYSDEC. The first was issued on June 22, 1983 and required the Star Sand & Gravel Corporation (Star Sand) to conduct a methane survey, install two ground-water monitoring wells, begin a ground-water sampling program, and limit landfilling to day-time hours only. The second was issued on August 6, 1985 and required Star Sand to determine the extent and nature of the contamination at the Site as well as prepare a remedial action plan.

A Phase I study of the Site was conducted by EA Science and Technology in 1987. EA was unable to make any final conclusion on possible Site contamination because of the lack of site specific upgradient ground-water quality results and no record of hazardous waste disposal at the Site.

A Phase II investigation of the Site was performed by Roux Associates to collect the data needed to calculate the final Hazard Ranking System (HRS) scores, so that the Site could be classified for further action by the NYSDEC. Field investigations included a site reconnaissance, an air monitoring survey, a soil gas survey, a limited geophysical survey, installation of five ground-water monitoring wells, the collection of soil samples for physical and chemical analysis, and the collection of six ground-water samples for chemical analysis. Ground water was analyzed to determine the occurrence and define the extent of potential contamination at the Site.

The soil gas survey detected methylene chloride and 1,2-dichloroethylene contamination on the western side of the landfill. 1,2-Dichloroethylene as well as 1,2,3-trichloropropane, benzene and toluene were found to be spread across the landfill portion of the Site, but the soil gas survey did not indicate a specific plume.

The one soil sample taken from the originally proposed location of MW-1 contained several volatile organic and semivolatile organic compounds. The borehole was abandoned at the request of NYSDEC personnel.

Metals and some semi-volatile compounds were detected in ground-water samples taken from the site. However, these concentrations are not significantly higher in the downgradient wells than in the upgradient wells and therefore no significant release of hazardous substances is believed to have occurred at the site.

The final HRS scores for the Star Sand & Gravel Corporation Site based upon this Phase II investigation have been calculated as follows (see Section 5):

Sm = 0
- Sgw = 0
- Ssw = 0
- Sa = 0

Sfe = Not Scored

Sdc = 0

Professional engineering review of this report has been furnished by Remedial Engineering, P.C., Huntington, New York.

4.0 SITE ASSESSMENT

4.1 History

The Site is the location of Star Sand & Gravel Corporation, and consists of a 40-acre sand mine, 3-acres of which reportedly has been used as a landfill for construction and demolition debris. The Site is located on Lawrence Road in the Town of Smithtown, Suffolk County, New York (Figure 1) and is owned by Mr. Thomas Gesuale of Dix Hills, New York. Mr. Gesuale has owned and operated the sand mine since the early 1970's. Previously the property was owned and operated by a Mr. Henry Santapatry (Reference 1, Appendix A).

The landfill is located in the northeastern corner of the Site (Figure 2), and was operated from 1978 until May 1985. In 1978, the Suffolk County Department of Health Services (SCDHS) required Mr. Gesuale to apply for a construction and demolition debris permit to operate the disposal site. After receiving the permit on December 8, 1981 Mr. Gesuale received some offsite construction and demolition debris at the Site. The permit expired on December 31, 1984, but Star Sand continued to dispose of rock and dirt material at the Site (Reference 1 and 2, Appendix A).

A surprise inspection of the Site was performed on February 2, 1981, by the SCDHS at the request of the Suffolk County District Attorney's office (Reference 3, Appendix A). During the inspection it was found that the owner was in violation of his operating permit by allowing papers, plastic, cans, fabric, and putrescible waste into the landfill and by failing to cover it daily. Also state and local agencies had received numerous complaints of odors and allegations of illegal dumping in the early morning hours. An early morning inspection of the site by NYSDEC officials on June 21, 1984 confirmed that disposal of material was occurring, but found no evidence of hazardous wastes being deposited at the Site (Reference 4, Appendix A). To date there has been no evidence found by state or local regulatory agencies, nor EA Science and Technology (generator of the Phase I report), that Star Sand has ever accepted any hazardous wastes. The Phase II investigation conducted by Roux Associates found no evidence of hazardous waste at the Site (References 3, 4, 5, Appendix A).

As a result of the inspections, two consent orders have been issued to Star Sand by the NYSDEC. The first order was the result of a compliance conference between NYSDEC (Region 1) and Star Sand, held on June 22, 1983, and required Star Sand to conduct a methane survey, install two ground-water monitoring wells, begin a ground-water sampling program, and limit landfilling to day-time hours only (Reference 6, 7, Appendix A).

On July 20, 1983 Star Sand began implementing the compliance schedule by performing an explosive gas survey at the Site. The survey performed by H2M showed that no major methane problems existed, but a smoldering fire was observed on the Site (Reference 8, Appendix A). The two ground-water wells were also installed in compliance with the consent order.

The two monitoring wells that were installed in compliance with the NYSDEC June 22, 1983 Consent Order, and the domestic well on the site, have been sampled by the NYSDEC and Star Sand. These wells have shown elevated levels of metals and volatile organics, but since there was no upgradient well on the site at the time of sampling, the origin of the contamination could not be determined. Wells MW-1 and MW-2 sampled by the NYSDEC on August 15, 1984 contained methylene chloride (136-191 ppb) and trace levels of 1,2-dichloroethylene (50.0 ppb), benzene (4.8 ppb), toluene (53.0 ppb), ethylbenzene (7.3 ppb), m-xylene (27.2 ppb), and o,p-xylene (21.0 ppb). Also, the water samples taken from the three on-site wells for the NYSDEC on December 21, 1984 contained cadmium (0.023-0.20 ppm), lead (0.13-0.20 ppm), and zinc (20-34 ppm) (Reference 5, Appendix A).

In 1982 and 1983 the SCDHS investigated the ground water in the vicinity of the Site. The ground-water samples were taken from four private wells upgradient of the Site. One of these wells, located 0.5 miles south of the Site contained iron (6.67 mg/liter) and 1,2,3-trichloropropane (110 mg/liter). The residents were advised by the SCDHS not to drink the water from the well and to obtain a new source of water. This well is hydraulically in line with the Site and may indicate an upgradient source of contamination (Reference 9, Appendix A).

On August 6, 1985 Star Sand entered into a second consent agreement with the NYSDEC. Star Sand agreed to determine the extent and nature of ground-water contamination at the Site as well as to prepare a remedial action plan for the Site, but apparently no work was undertaken since the NYSDEC is performing a Phase II investigation (Reference 10, 11, 12, Appendix A).

NUS Corporation (NUS), an Environmental Protection Agency (EPA) contractor, issued the final draft of its EPA Site Inspection Report And Hazard Ranking Model for the Site on June 13, 1986. During the inspection of the site NUS conducted ground-water and soil sampling at the Site. The ground-water samples were taken from the two monitoring wells installed at the site. These samples contained zinc, lead, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, and benzo(a)pyrene. The soil samples were taken at four locations in and around the landfill. The soil samples contained bis(2-ethylhexyl)phthalate, benzo(k)fluoranthene, dibenzo(a,h)anthracene, di-n-butylphthalate, benzo(g,h,i)perylene, butylbenzylphthalate, alpha-BHC, gamma-BHC (lindane), and Aroclor 1242. The concentrations of the contaminants can be found in Reference 13, Appendix A of this report.

Several site changes were noted since the completion of the Phase I report in June of 1985. The landfill portion of the site has expanded to approximately 3.7 acres as opposed to the approximately 3 acres reported in the Phase I report. Also, the sand excavation which is still being done has expanded to the fence line at the northern edge of the property. It should be noted that the Site is located within an active operation which is still undergoing changes. There are also breaks in the fence bordering the property, allowing access by foot. During Roux Associates site activities, the dumping of concrete, soil, and wood was observed, but no depositing of hazardous materials.

The Town of Smithtown Code Enforcement Bureau, Fire Marshal Division, conducted an inspection of the facility for fire and explosion hazards on June 14, 1990. The Fire Marshal cited numerous violations with the facility due to improper storage of flammable materials used at the facility, and improper safety precautions and observation that petroleum-type products had been leaked and/or dumped at the Site. These violations however do not

refer to any hazardous substances associated with the landfill, but are due to the day to day operations of the Star Sand & Gravel Corporation (Section 5, Reference 11).

4.2 Topography

The Site is located in the north-central portion of Long Island in Suffolk County at approximately 100 feet above mean sea level. The Site is located within a sand pit and is surrounded by 40 foot high walls to the north, south, and west sides. The regional terrain slopes gently (~1.25%) to the south-east towards a tributary of Willow Pond and the Nissequogue River approximately 1.25 miles away, but is not readily accessible to runoff from the Site (Reference 7, Section 5).

The Site is mostly surrounded by wooded areas presently undergoing residential development. To the south is a commercial property, CABRO Precast Concrete Products, another sand pit, located 0.22 miles away (Roux Site Visit May 25, 1990).

4.3 Air Survey

An air monitoring survey was conducted at the Site on May 25, 1990 to determine the quality of air in and around the landfill portion of the site in order to delineate the source of any airborne contaminants.

A perimeter survey of the Site was conducted utilizing an OVA, OVM, Tri-Gas Meter, and a Radiometer. The readings on all four instruments and wind direction were recorded as they occurred. Throughout the entire survey no readings on any of the instruments were observed except 10-15 microroentgens per hour (ur/hr) were registered on the radiometer. Normal background radiation ranges are from 5 ur/hr to 25 ur/hr.

During drilling operations, the four above-mentioned instruments were used to continuously monitor any emissions emanating from the boreholes. During the drilling operation only one reading was observed. This was at the first location of MW-1, which was abandoned at 15 feet. The reading at this hole was in excess of 1,500 ppm on the OVM. As a result, a sample was taken and sent to H2M Laboratories for analysis.

4.4 Hydrogeology

Ground water in the area occurs in the wedge-shape accumulation of unconsolidated sediments of Pleistocene and Upper Cretaceous age which are approximately 1100 feet in thickness in the vicinity of the Site. This ground water is part of the Nassau/Suffolk Aquifer System which is a sole source aquifer. The basal bedrock on which these sediments lie is of Precambrian age and consist of schists and gneisses which outcrop in western Queens County and dip southeast an average of about 65 feet per mile, or slightly less than one degree, to an estimated depth of about 2000 feet in the south-central Suffolk County. The surface of the bedrock is approximately 1000 feet below mean sea level in the vicinity of the Site (Reference 1, Section 5).

The Cretaceous fluvial and deltaic deposits rest directly upon the clay-like weathered surface of Precambrian bedrock, and are divided into the Raritan Formation and the overlying Magothy Formation. The Raritan Formation is composed of a lower sand member (Lloyd Sand Aquifer) and a clay member, both of which are widely distributed on Long Island. The top of the Lloyd Sand in Suffolk County ranges from 200-1700 feet below sea level, and its thickness ranges from 150 feet in the northwestern part of Suffolk County to over 300 feet in the southeastern part of the county (Reference 1, Section V).

The Raritan clay member serves to confine water in the underlying Lloyd aquifer and retards but does not prevent flow between the Lloyd and the overlying Magothy aquifer. The top of the Raritan clay in Suffolk County ranges from 100-1400 feet below sea level trending northwest to southeast, respectively, and its thickness ranges from 100-300 feet, following the same trend (Reference 1, Section 5).

The Magothy Formation consists of a great thickness of alternating fine sands, clays, silts, and some coarse beds of sand and gravel. The top of the formation ranges from 300 feet above to 250 feet below sea level, and ranges in thickness from 330-1000 feet in Suffolk County (Reference 1, Section 5).

The Pleistocene glacial deposits which constitute the Upper Glacial aquifer unconformably overlie an irregular Magothy surface eroded and scoured by glacial contact. A deep well in the vicinity of the Site indicates that the glacial deposits extend to a depth of 75 feet

below the National Geodetic Vertical Datum of 1929 (roughly correlative to mean sea level), thus placing the Magothy-Glacial interface at approximately 175 feet below land surface elevation at the Site (Reference 10 Section 5).

Water-level measurements taken at the Site on August 13, 1991 (Table 2) indicate that ground-water elevation of the water table to a common datum is approximately 49 feet and generally flows to the northwest toward Long Island Sound. The water-level measurements taken on January 15 and April 22, 1991 indicate that ground water flows generally to the north-northwest with each respectively having converging and diverging flow patters. These alternate flow patterns can be attributed to differences in precipitation and recharge that traditionally occur at each of these times of year and are temporary conditions. The north-northeast flow direction recorded on the August 13, 1991 event is considered the predominent condition since it agrees with regional flow.

Grain size analysis of samples were taken from the screened zone of each well and analyzed for grain size. The results indicate that the screened zones for each well are primarily composed of sand with traces of gravel and silt. Results of the grain size analysis tests can be found in Appendix F.

One rising head slug test was conducted in each of the five monitoring wells installed at the Star Sand & Gravel Site. The slug tests were performed in accordance with Roux Associates, Inc. Standard Operating Procedures (SOPs). The purpose of a slug test is to determine the hydraulic conductivity of an unconfined aquifer without having to perform a pumping test. During each slug test, time versus drawdown data was measured and continually recorded using a HERMIT™ SE2000 Environmental Data Logger, In Situ Inc., Laramie, Wyoming.

Each of the four monitoring wells installed at the Smithtown Landfill Site has a casing diameter of 2 inches, with a borehole diameter of 10 inches. Since the borehole diameter is large in relation to the well diameter, a substantial amount of drawdown was needed to successfully stress the aquifer during a slug test. Due to the negligible maximum drawdown value (y_0) obtained during each slug test (Appendix G), it appears that the aquifer was not affected by the stress (i.e., drawdown) and that all drawdown measured took place within

the gravel pack of each well. thus any attempt to analyze the slug test data would yield hydraulic conductivity data characteristics of the gravel pack and not the aquifer formation.

The hydraulic conductivity values for the five wells tested range from 153 ft/d (1144 gallons per day per square foot (gpd/ft^2)) at well MW-1, to 299 ft/d (2237 gpd/ft^2) at well MW-5. According to published data, the average hydraulic conductivity of the upper glacial aquifer in northwestern Suffolk County is 187 ft/d (1400 gpd/ft^2, Reference 14), while the average for the entire upper glacial aquifer is 270 ft/d (2020 gpd/ft^2, Reference 15).

4.5 Ground-water and Soil Quality

The soil gas survey consisted of 51 soil gas samples taken at accessible points shown on Figure 4. The results of sampling, locations and concentration of detected compounds can be found in Appendix B.

Four volatile organic compound (VOC's) (methylene chloride, 1,2-dichloroethylene, benzene, and toluene) were detected across the site.

Methylene chloride was detected in high concentrations on the west side of the landfill and ranged from 2-316 ppm (average concentrations in this region were 129 ppm). Since this was only detected in one area of the site, a localized source of the contaminant may be suggested.

1,2-Dichloroethylene was found across the entire site in 47 of the samples taken, generally in the range from 0.91 to 28 ppm. One sample contained 164 ppm. Concentrations were highest to the west of the landfill portion of the site but generally were over 10 ppm across the site. These detections may indicate that the source is located off-site to the west of the landfill near the area of high detections.

Benzene and toluene detections were scattered across the site. Benzene was found in 17 samples with concentrations that ranged from trace amounts to 0.5 ppm and toluene was found in 4 samples ranging from 0.1 to 5 ppm. One sample contained ethylbenzene in trace quantities. These detections may be the result of heavy equipment usage on the Site.

1,2,3-Trichloropropane was detected in 45 of the samples taken, however these detections could not be quantified. The equipment could not be calibrated because a standard for this compound was not available.

One soil sample was taken at the originally proposed location of MW-1 (the sample was labeled B-1) at a depth of approximately 10 feet. The borehole was the originally proposed location of monitoring well MW-1. The borehole was advanced to 15 feet when metal debris (presumably truck or car parts) was encountered. Due to the debris and high readings on the OVM (>1,500 ppm), the well location was abandoned and the sample was taken from the well cuttings located at the top of the borehole. This was done due to the lack of recovery in the split-spoon and may have resulted in the volatilization of contaminants. The sample was analyzed for VOC's and semi-volatile organic compounds (semi-volatiles). A total of 11 VOC's ranging from 2 to 150 ug/kg and 19 semi-volatile compounds ranging from 160 to 3,200 ug/kg as well as several tentatively identified compounds (TIC's) were detected in B-1. Results of this sample can be found in Table 3. Bis (2-ethylhexyl) phthalate was found at 18,000 ug/kg but is a normal lab contaminant and was not included in the range quotes above.

The detections recorded may be the result of buried car or machine equipment. The detections recorded would be consistent with oils and solvents used in the operation or cleaning of this equipment.

Six ground-water samples were collected from the five new monitoring wells located on the site (MW-1 through MW-5). Sample MW-X was a blind duplicate of MW-3. A summary of the analytical results can be found in Table 4. For evaluation, the analytical results were compared to the standards given in 6 NYCRR 703 and 10 NYCRR 5-1 tables (Appendix H).

One semi-volatile compound, bis(2-ethylhexyl)phthalate, was detected in monitoring wells MW-1, 2, 3, 5 and in the trip blank at concentrations above the Federal and New York State standard of 4,200 ug/l. Phthalates are common plasticizers in PVC, and the presence of this phthalate is likely due to the PVC used for the well casing. It is also a common laboratory contaminant, which would explain the bailer blank contamination. Several tentatively

identified compounds (TIC's) were also detected in monitoring wells MW-1 and MW-2 and estimated concentrations are provided for them.

Chromium and silver were detected above the detection limit in all of the monitoring wells sampled at the Site. Chromium was detected above the standard of 50 ug/l in MW-2 at 58.8 ug/l. MW-1, MW-3, MW-4, and MW-5 detections were at 15.0 ug/l, 40.6 ug/l, 16.4 ug/l and 13.7 ug/l, respectively. Silver was detected above the standard of 50 ug/l in MW-1 at 150 ug/l, MW-2, MW-3, MW-4 and MW-5 detections were 50 ug/l, 30 ug/l, 20 ug/l, and 20 ug/l,respectively.

Cadmium was detected just above the ground-water standard of 10 ug/l only in well MW-2 at 11.1 ug/l, and at 3.6 ug/l and 3.8 ug/l in MW-3 and MW-5 respectively.

Aluminum, calcium, iron, magnesium, potassium, and sodium (all of which are common elements in ground water) showed high concentrations as compared to Federal and state ground-water standards in Appendix H.

The chromium and cadmium levels increase from upgradient to downgradient, across the landfill. The silver concentrations decrease, suggesting the source is upgradient of the landfill. Although these concentrations do not appear to be naturally occurring, they do not represent an observed release in terms of HRS scoring.

The frequency and consistency with which metals are detected above and below the ground-water standards can be attributed to a number of factors. The ground water at the Site has a slightly lower than normal pH. This slightly acidic condition results in dissolving metals into the ground water more readily than under balanced pH conditions. These metal constituents may be attributed to materials that were permitted to be disposed of at the landfill and are not solely indicative of hazardous waste disposal.

For unknown reasons (possibly due to grout above the bentonite seal) an unusually high pH was identified in monitoring well MW-1. All of the other physical parameters in MW-1, as in the other wells at the Site, do not exhibit any other unusually high readings.

4.6 Conclusions

In reviewing all of the ground-water quality data, it is apparent that the water quality in the downgradient wells (MW-2, MW-3, and MW-4) is not significantly different from the water quality in the upgradient wells (MW-1 and MW-5). Only metal constituents have been found in the ground water at the Site and this is believed to be the result of the overall elevated pH levels across the Site.

However, considering the results obtained from the soil gas survey and the one soil sample taken on the Site, it appears that contamination of the soils does exist. Additional soil sampling may be in order to further delineate the extent and concentration of any soil contamination at the Site. Also, continued sampling of the monitoring wells is suggested to determine if contamination from the overlying soils is leaching to the ground water.

4.7 Site Assessment References

(1) Gesuale, T. January 21, 1986. Interview with EA Science and Technology, (attached).

(2) Bruckman, M. December 12, 1981. Notice of Permit for a demolition debris landfill for the Star Sand & Gravel Corporation (attached)

(3) Pim, J. February 10, 1981. Suffolk County Department of Health Services surprise inspection report for the Star Sand & Gravel Corporation Site conducted on February 9, 1981. (attached).

(4) Kelly, ECO June 21, 1984. New York State Department of Environmental Conservation follow-up inspection report on Steck & Philbin, Northeast Mines and Star Sand & Gravel Corporation Demolition Debris Landfill Sites. (attached)

(5) EA Science and Technology, June, 1987. Engineering Investigations at Inactive Hazardous Waste Sites Phase I Investigation, Star Sand & Gravel Corporation (Roux Associates files)

(6) New York State Department of Environmental Conservation, January 3, 1984. Compliance Conference Report for the Star Sand & Gravel Corporation Site (attached)

(7) New York State Department of Environmental Conservation, January 18, 1984 Order of Consent for the Star Sand & Gravel Corporation (attached)

(8) Bontje, M.P., July 22, 1983. Letter to Mr. Thomas Gesuale regarding results of soil gas survey and accompanying recommendations. (attached)

(9) Suffolk County Department of Health Services, sampling results for private wells in the vicinity of the Star Sand & Gravel Corporation Site. (attached)

(10) Barbato, P. and Scerb, J., October 1, 1984. Letter regarding second Consent Order and additions to that order. (attached)

(11) New York Department of Environmental Conservation, August, 1985 Order of Consent for the Star Sand & Gravel Corporation Site. (attached)

(12) Boesch, G.E., June 21, 1985. H2M proposal for engineering services in compliance with the Order of Consent issued in August of 1985 (attached)

(13) NUS Corporation, June 13, 1986. Environmental Protection Agency Site Inspection Report and Hazard Ranking Model for the Star Sand & Gravel Corporation Site. (Roux Associates files)

(14) McClymonds, N.E. and O.L. Franke, 1972. Water-Transmitting Properties of Aquifers on Long Island, New York. United States Geological Survey, Professional Paper 627-E (Roux Associates files)

(15) Franke, O.L. and P. Cohen, 1972. Regional Rates of Ground-Water Movement on Long Island, New York. United States Geological Survey Professional Paper 800-C, pp. 271-272. (Roux Associates files)

Table 1. Monitoring Well Construction Details, Star Sand & Gravel Corporation, Smithtown, New York.

Well Number	Bottom of Boring (ft below land surface)	Screened Zone (ft below land surface)	Elevation of Measuring Point* (ft relative to a commom datum)	Height of Measuring Point (ft)**	Land Surface Elevation (ft relative to a commom datum)	Well Diameter (inches)
MW-1	26.00	11-26	60.36	0.96	59.40	2
MW-2	55.00	39-54	90.45	2.35	88.10	2
MW-3	55.00	39-54	93.79	3.19	90.60	2
MW-4	55.00	40-55	92.06	1.36	90.70	2
MW-5	56.00	41-56	89.52	0.92	88.60	2

* - Measuring point of all monitoring wells is the top of the PVC casing.
** - Measurement from land surface to measuring point.

GH07708Y

Table 2. Water Level Measurements Taken on January 15, 1991, April 22, 1991, and August 13, 1991, Star Sand and Gravel Corporation, Smithtown, New York.

Well Number	Elevation of Measuring Point (ft relative to a common datum)	January 15, 1991		April 22, 1991		Change (ft) Jan-April
		Depth to Water (ft below measuring point)	Elevation of Water Table (ft relative to a common datum)	Depth to Water (ft below measuring point)	Elevation of Water Table (ft relative to a common datum)	
MW-1	60.36	10.74	49.62	10.00	50.36	-0.74
MW-2	90.45	43.53	46.92	40.05	50.40	+3.48
MW-3	93.79	45.07	48.72	43.84	49.95	-1.23
MW-4	92.06	42.86	49.20	41.65	50.41	-1.21
MW-5	89.52	40.45	49.07	38.29	51.23	-2.16

Well Number	Elevation of Measuring Point (ft relative to a common datum)	August 13, 1991	
		Depth to Water (ft below measuring point)	Elevation of Water Table (ft relative to a common datum)
MW-1	60.36	10.82	49.54
MW-2	90.45	41.97	48.48
MW-3	93.79	45.57	48.22
MW-4	92.06	44.29	47.77
MW-5	89.52	40.38	49.14

* These water levels are used for the ground water flow map.

GH07708Y

Table 3. Summary of Soil Boring B-1 Analytical Data Sampled on October 5, 1990, Star Sand & Gravel, Smithtown, New York.

Soil Sample Designation: B-1

(All sample concentrations in ug/kg on a dry weight basis)

VOLATILE ORGANIC COMPOUNDS	
Methylene chloride	14
1,2-Dichloroethene (total)	150
Trichloroethene	28
Tetrachloroethene	30
Toluene	19
Ethylbenzene	14
Xylene (total)	81
Acetone	89
Vinyl chloride	10 J
2-Butanone	9 J
Carbon disulfide	2 J
Benzene	2 J
Tentatively Identified Compounds	
Cyclohexane, methyl -(8CI9CI)	20 J
Unknown	23 J
Tetramethyl cyclopentane isomer	13 J
Unknown	9 J
Ethyl methyl cyclohexane isomer	10 J
Dimethyl heptane isomer	10 J
Ethyl dimethyl bicyclor (3.1.0) hexane isomer	39 J
Tetramethyl pentanone isomer	44 J
SEMI-VOLATILE ORGANIC COMPOUNDS	
Naphthalene	230 J
2-Methylnaphthalene	450 J
Acenaphthene	310 J
Dibenzofuran	270 J
Fluorene	510 J
Phenanthrene	3100
Anthracene	560 J
Di-n-butylphthalate	160 J
Fluoranthene	2600
Pyrene	3200
Butylbenzylphthalate	690 J
Benzo (a) anthracene	2400
Chrysene	2400
Bis (2-ethylhexyl) phthalate	18000 B
Benzo (b) fluoranthene	2500
Benzo (a) pyrene	2000
Indeno (1,2,3-cd) pyrene	1100
Dibenz (a,h) anthracene	400 J
Benzo (g,h,i) perylene	1300

J - Estimated value and is below specified quantitation limit but greater than zero.
B - Found in blank

Table 3. Summary of Soil Boring B-1 Analytical Data Sampled on October 5, 1990, Star Sand & Gravel, Smithtown, New York.

Soil Sample Designation: B-1

(All sample concentrations in ug/kg on a dry weight basis)

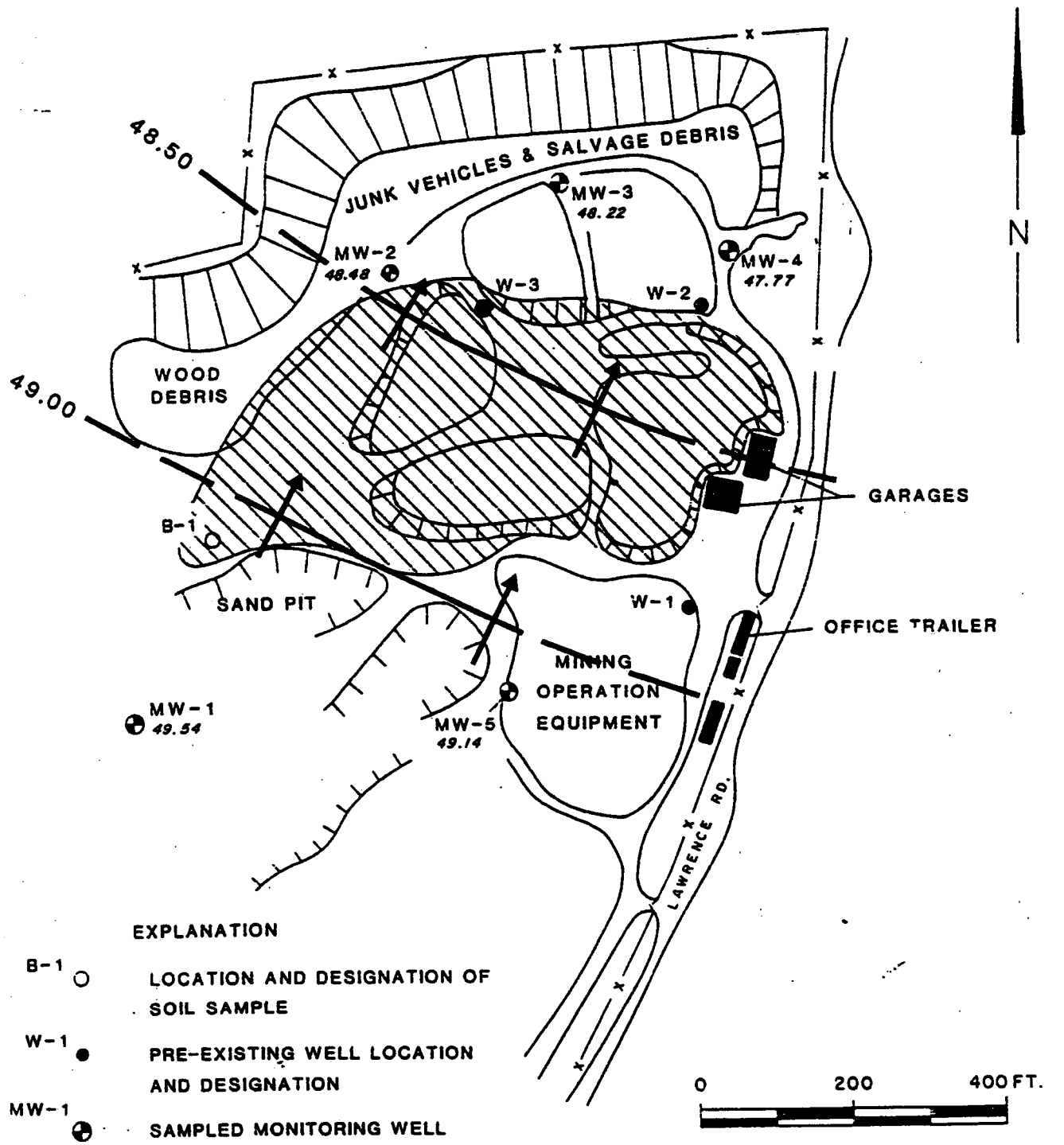
Tentatively Identified Compounds	
Unknown	360 J
Unknown	510 J
Unknown	1200 J
Unknown alphatic hydrocarbon	360 J
Unknown alphatic hydrocarbon	580 J
Unknown alphatic hydrocarbon	430 J
Unknown alphatic hydrocarbon	360 J
Unknown alphatic hydrocarbon	360 J
Unknown alphatic hydrocarbon	360 J
Unknown alphatic hydrocarbon	430 J
Unknown alphatic hydrocarbon	430 J
Unknown alphatic hydrocarbon	430 J
Unknown alphatic hydrocarbon	1200 J
Unknown alphatic hydrocarbon	1700 J
Unknown alphatic hydrocarbon	1500 J
Unknown alphatic hydrocarbon	220 J
Unknown alphatic hydrocarbon	290 J
Unknown alphatic hydrocarbon	510 J
Unknown alphatic hydrocarbon	3000 J

J - Estimated value and is below specified quantitation limit but greater than zero.
B - Found in blank

Table 4. Summary of Ground-Water Analytical Data Sampled on January 15, 1991, Star Sand and Gravel, Smithtown, New York.

Well Designation:	MW-1	MW-2	MW-3	MW-4	MW-5	MW-X*
(All sample concentrations in ug/L)						
VOLATILE ORGANIC COMPOUNDS	ND	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS***						
bis (2-Ethylhexyl) phthalate	19 U	54 U	16 U	4 U	8 U	11 U
Tentatively Identified Compounds**						
Unknown	12 J	20 J	ND	ND	ND	ND
Dimethyl indene isomer	8 J	ND	ND	ND	ND	ND
Dimethyl indene isomer	8 J	ND	ND	ND	ND	ND
Methyl benzo (b) thiophene iso	12 J	ND	ND	ND	ND	ND
Methylethyl idene cyclopropyl	10 J	ND	ND	ND	ND	ND
Methylethyl idene cyclopropyl	16 J	ND	ND	ND	ND	ND
Dihyrotrimethyl naphthalene	8 J	ND	ND	ND	ND	ND
Unknown	10 J	ND	ND	ND	ND	ND
Unknown	10 J	ND	ND	ND	ND	ND
Unknown	10 J	ND	ND	ND	ND	ND
Unknown	14 J	ND	ND	ND	ND	ND
Methyl fluorene isomer	19 J	ND	ND	ND	ND	ND
Unknown PAH	42 J	ND	ND	ND	ND	ND
Methyl phenanthrene isomer	22 J	ND	ND	ND	ND	ND
Unknown	18 J	ND	ND	ND	ND	ND
Trimethyl hexane isomer	ND J	10 J	ND	ND	ND	ND
PESTICIDES and PCBS	ND	ND	ND	ND	ND	ND
METALS***						
Aluminum	8600	59000	29400	13900	16800	50500
Barium	325	326	235	127 B	107 B	309
Beryllium	2.6 B	6.3	5.4	2.1 B	1.6 B	6.5
Cadmium	ND	11.1 J	3.6 J	ND	3.8 J	8.4 J
Calcium	92100	22600	140000	43600	19800	139000
Chromium	15 J	58.8 J	40.6 J	16.4 J	13.7 J	73.4 J
Cobalt	7.2 B	48.1 B	25.70 B	11.9 B	15.2 B	37.9 B
Copper	18.4 B	53.60	34.90	16.7 B	19.8 B	54.3
Iron	6810	81300	38200	14800	18300	60600
Lead	4.3 B	36.6	16.9	8.0	9.6	17.9
Magnesium	5470	10700	80000	10100	7890	81600
Manganese	719	2860	956	741	570	1300
Nickel	15.9 B	71.8	54.3	21.0 B	30.8 B	73.0
Potassium	43300	8170	9030	3790 B	3330 B	11600
Silver	150	50.0	30.0	20.0	20.0	40.0
Sodium	26500	7240	233000	3750 B	7130	230000
Vanadium	7.2 B	136	63.60	22.6 B	27.0 B	108
Zinc	30.0	150	110	50.0	40.0	150
PHYSICAL PARAMETERS						
COD (mg/L)	90	20	100	15	<15	130
Specific Conductivity (umhos)	890	160	2580	360	220	2600
pH (units)	11.2	6.3	5.7	6.2	6.1	5.8
Suspended solids (mg/L)	144	950	1360	293	413	1410
Total dissolved solids (mg/L)	437	101	1740	214	140	1740

* - Duplicate of MW-3
** - Estimated concentration
*** - Compounds not detected are not listed.
ND - Not detected
J - Estimated value. Due to deviation in quality control limits.
U - Not detected; qualified through method blank.
B - Reported volume is less than Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL).



EXPLANATION

- B-1 ○ — LOCATION AND DESIGNATION OF SOIL SAMPLE
- W-1 ● — PRE-EXISTING WELL LOCATION AND DESIGNATION
- MW-1 ◒ — SAMPLED MONITORING WELL LOCATION AND DESIGNATION
- LANDFILL AREA
- SLOPED PORTION OF SITE
- x — CHAIN LINK FENCE
- ACCESS ROADS
- 49.54 — GROUND-WATER ELEVATION
- WATER-TABLE CONTOUR LINE AND FLOW DIRECTION

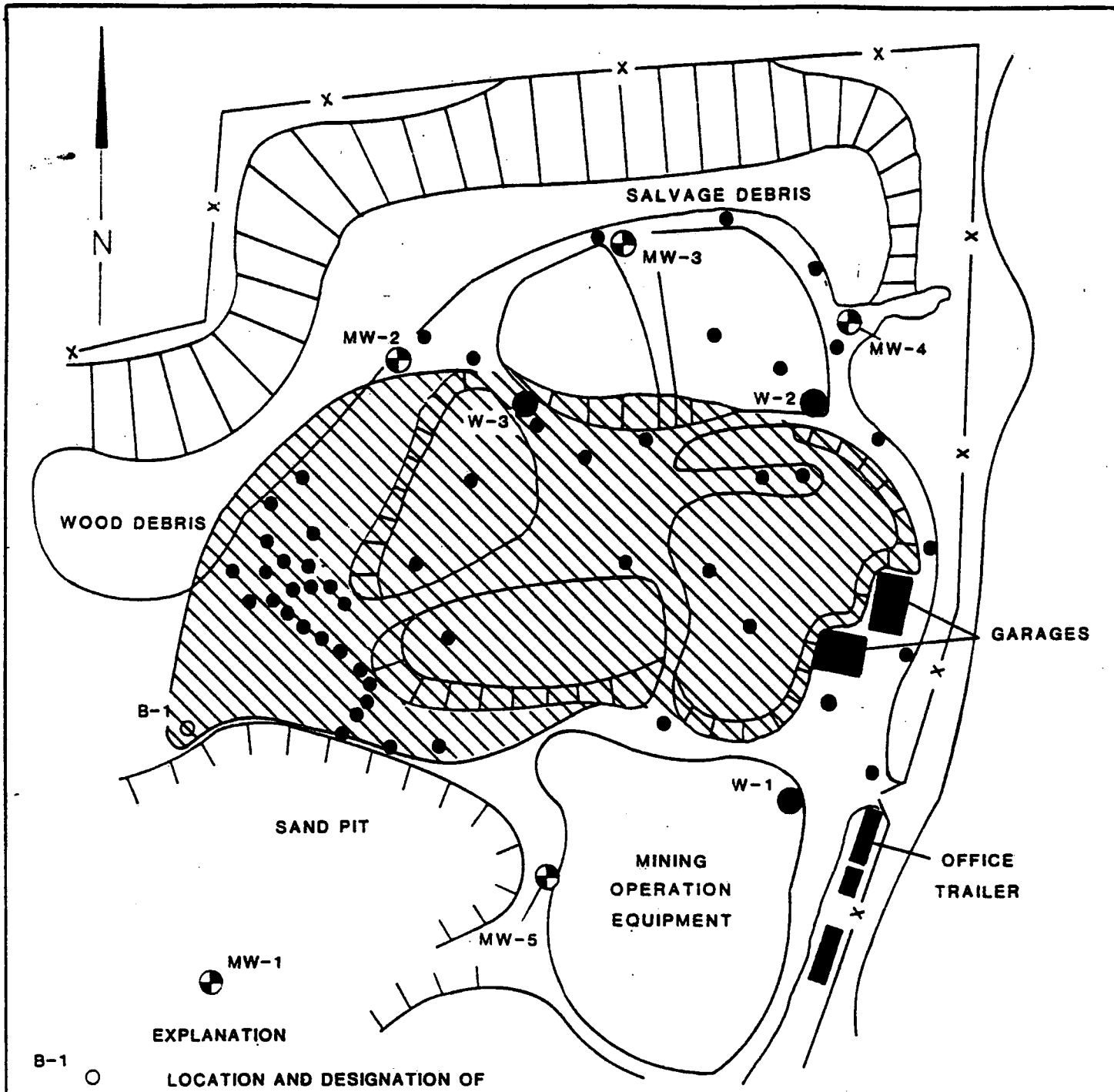
Title:

ELEVATION OF WATER TABLE AUGUST 13, 1991

Prepared for: GIBBS & HILL

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers

Compiled by: E.A.	Date:	Figure: 3
Prepared by: C.R.	Scale: SHOWN	
Project Mgr: J.W.	Revision: 0	
File No: 07708Y		



Title:

LOCATION OF SOIL GAS SURVEY SAMPLING POINTS

Prepared for

GIBBS & HILL

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers

Compiled by E A	Date 7/90	Figure
Prepared by S W	Scale SHOWN	4
Project Mgr J W	Revision: 0	
File No 0770.8		

REFERENCE NO. 15

Appendix 1.1-22

New York State Department of Environmental Conservation

MEMORANDUM

Received from NYSDEC Region 1

152097

Scherb

P. Barbato PB

nsent Order, Star Sand & Gravel

October 1, 1984

Based on our meeting with Mr. Gesuale on September 20, 1984, d the information available to this office, it is requested that he proposed Consent Order incorporate the following items:

1. Immediate commencement of Remedial Investigation to determine the extent and nature of groundwater contamination and determine the need for remedial action. This should be completed within five (5) months.

2. Financial surety for:

   a. Remedial Action, $500,000;

   b. Site Closure, $100,000 (Note: this may already be covered under his mining permit).

3. Preparation of a Remedial Action Plan within six (6) months from now.

4. Provide evidence of work performed to correct odor violations and prevent odors from traveling off-site.

Since this facility has been designated as a State Superfund te, all remedial action should be performed in accordance with the equirements of that program. Also, the Consent Order must be reviewed by DEE before we send it out.

B:dm

c: A. Machlin
R. Becherer
R. Schneck ✓

REFERENCE NO. 16

STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

In the Matter of the Alleged Violation of Part 360 of Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York, by	ORDER ON CONSENT
STAR SAND AND GRAVEL CORP.	FILE NO. 1-1128
(Suffolk County) Respondent	

WHEREAS, Part 360 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York sets forth the provisions for operation of a solid waste management facility; and

WHEREAS, this Department has documented an instance of Respondent having caused or permitting to be caused, the violation of the conditions outlined in your Part 360 Permit, which resulted in groundwater contamination; and

WHEREAS, Respondent has affirmatively waived its right to a public hearing in this matter in the manner provided by law, and and having consented to the entering and issuing of this Order, agrees to be bound by the terms and conditions contained herein.

NOW, having considered this matter and being duly advised, it is

ORDERED, that with respect to the aforementioned violation, there is hereby imposed upon Respondent, a penalty in the sum of Ten Thousand ($10,000) Dollars, said penalty to be suspended, providing Respondent strictly adheres to the terms and conditions outlined in Schedule A, the compliance schedule attached hereto an made a part hereof.

ORDERED, that the provisions, terms and conditions of this Order shall be deemed to bind Respondent, its successors and assigns and all persons, firms and corporations acting under or for it, including, but not limited to those who may carry on any or all of the operations now being conducted by Respondent, whether at the present location or at any other in this State; and it is further

ORDERED, that in those instances in which the Respondent desires that any of the provisions, terms or conditions of this Order be changed, it shall make written report, setting forth the grounds for the relief sought, to the Commissioner, c/o Joan B. Scherb, Regional Attorney, New York State Department of Environmental Conservation, Building 40, State University of New York, Stony Brook, New York 11794; and it is further

ORDERED, that any change in this Order shall not be made or become effective, except as specifically set forth by written order of the Commissioner, such written order being made either upon written application of the Respondent, or upon the Commissioner's own findings.

Dated: Albany, New York
1985

HENRY G. WILLIAMS
Commissioner of Environmental Conservation

By_____
HAROLD D. BERGER
Regional Director

To: Star Sand & Gravel Corp.
35 Landview Avenue
Dix Hills, New York 11746
Att: Mr. Thomas Gesuale, President

CONSENT BY RESPONDENT

Respondent acknowledges the authority and jurisdicition of the Commissioner of Environmental Conservation of the State of New York to issue to foregoing Order, waives public hearing or other proceedings in this matter, accepts the terms and conditions set forth in the Order and consents to the issuance thereof

Thomas Gesuale
as President

STATE OF NEW YORK)
s.s.:
COUNTY OF)

On the 6th day of August 1985, before me personally came Thomas Gesuale to me known, who being duly sworn, deposed and said, that he resides at 35 Landview Dr. Dix Hills that he is the President of Respondent Corporation and that he signed his name for and on behalf of said corporation with full authority so to do.

Gregory J. Nolan
NOTARY PUBLIC

GREGORY J. NOLAN
NOTARY PUBLIC, State of New York
No. 24-4681320
Qualified in Kings County
Commission Expires March 30, 1986

SCHEDULE A

Compliance Schedule

for
STAR SAND AND GRAVEL CORP.

Immediately,	Respondent shall commence Remedial Investigation to determine the nature and extent of groundwater contamination and the remedial action to be undertaken. This investigation should be performed by a Professional Engineer, licensed in the State of New York, and be completed within five (5) months.
Within ten (10) days of execution of this Order,	Respondent shall submit a bond in the sum of ~~Five Hundred~~ Thousand ($500,000) Dollars to ensure appropriate remedial action on site.
Within thirty (30) days of execution of this Order,	Respondent shall provide evidence of work performed to correct odor violations and prevent odors from traveling off-site.
Within six (6) months of execution of this Order,	Respondent shall have prepared a Remedial Action Plan.

REFERENCE NO. 17

02-8603-19-SI

FINAL DRAFT
SITE INSPECTION REPORT
AND HAZARDOUS RANKING SYSTEM MODEL
STAR SAND AND GRAVEL
KINGS PARK, NEW YORK

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8603-19
CONTRACT NO. 68-01-6699

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 13, 1986

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY

Daniel Caramagno

DANIEL CARAMAGNO
PROJECT MANAGER

REVIEWED/APPROVED BY

Ronald M Naman

RONALD M. NAMAN
REGIONAL PROJECT MANAGER

NUS CORPORATION
A Halliburton Company

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
EXECUTIVE SUMMARY

Star Sand & Gravel **Site Name**	New Site **EPA Site ID Number**
Kings Park, New York **Address**	02-8603-19 **TDD Number**

SITE DESCRIPTION

Star Sand and Gravel is a sand mining operation located on Long Island in Kings Park, New York. At the facility is a four acre site which is used as a demolition debris landfill. The current owner, Mr. T. Gesuale Sr., has operated the facility for 25 years. Prior to this the facility was maintained by a Mr. Santepatri for an unknown amount of time.

Files maintained by NYDEC Region I offices at Stony Brook contain several complaints by the Town of Smithtown concerning groundwater contamination, unauthorized dumping, and noxious odors emanating from the facility. In 1983 an underground fire was discovered and eventually put out. In addition contaminants such as heavy metals and solvents were detected in on site monitoring wells in 1984. Also, four domestic wells south of the site were tested by local health officials and one was found to contain organic contaminants. Well contamination from Star Sand and Gravel cannot be confirmed however as many landfills exist in the area and on site groundwater flow direction is not known.

The facility has been issued two Consent Orders by the NYDEC in 1983 and 1985 and has temporarily suspended landfill operations. Several delays occurred in compliance to the Consent Orders but Star Sand and Gravel has currently hired a consultant in order to comply with the orders.

HAZARD RANKING SCORE: $S_M = 31.01$ ($S_{gw} = 53.59$ $S_{sw} = 2.66$ $S_a = 0$)
$S_{FE} = 7.92$
$S_{DC} = 50.00$

Prepared by: Daniel Caramagno **Date:** 6/2/86
of NUS Corporation

TABLE 1

SAMPLE DESCRIPTIONS
STAR SAND AND GRAVEL
KINGS PARK, NEW YORK

Sample ID Number	Sample Type	Traffic Report #	Time	Sample Location
NYK9-GW1	Organic Aqueous Inorganic Aqeuous	BE654 MBG026	1130	From 58' deep well at northwest section of site. Well is 100' north of current landfill area.
NYK9-GW2	Organic Aqueous Inorganic Aqueous	BE655 MBG027	1248	From 63' deep well east about 150' from well used for obtaining sample GW1.
NYK9-S1	Organic Soil Inorganic Soil	BE656 MBG022	1354	Subsurface soil sample is taken at bottom of pit and about 20' south of the edge of fill material (see map). Sample taken from 2½' depth. Sample was moist, suggesting that the water table was hit.
NYK9-S2	Organic Soil Inorganic Soil	BE657 MBG023	1410	Subsurface soil sample taken on top of fill material. Sample is 50' north from the edge of fill material. Sample was taken at 1' in depth.
NYK9-S3	Organic Soil Inorganic Soil	BE658 MBG024	1435	Subsurface soil sample taken at western edge of fill material. Sample taken at 1' in depth.
NYK9-S4	Organic Soil Inorganic Soil	BE659 MBG025	1455	Subsurface soil sample taken at a depth of 1'. Sample is about 50' east of current pit area and is on top of an old fill area.
NYK9-B1	Organic Blank Inorganic Blank	BE660 MBG028	N/A	U.S. EPA Laboratories, Edison, New Jersey.

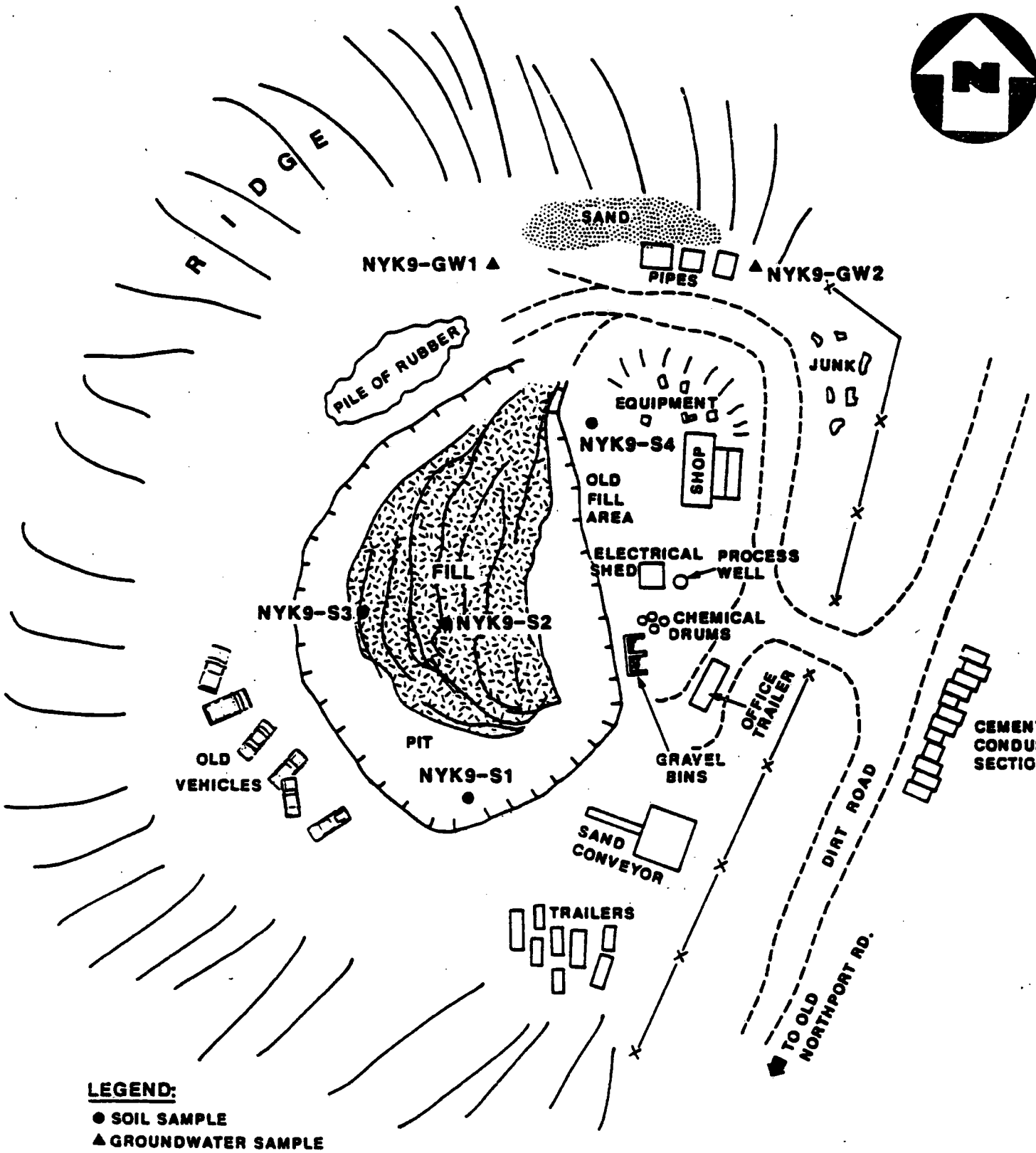


FIGURE 2

SAMPLE LOCATION MAP

STAR SAND AND GRAVEL, KINGS PARK, N.Y.

(NOT TO SCALE)

NUS CORPORATION

A Halliburton Company

Sample Number
BE654

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc.
Case No: 5945
Lab Sample ID No: CLP 009 817
QC Report No: CC1
Sample Matrix: Water
Contract No: 68-01-7278
Data Release Authorized By:
Date Sample Received: 05/07/86

Volatile Compounds

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: NA
Date Analyzed: 5/13/86
Conc/Dil Factor: 1.0 pH 7
Percent Moisture: (Not Decanted) N/A

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	10u
74-83-9	Bromomethane	10u
75-01-4	Vinyl Chloride	10u
75-00-3	Chloroethane	10u
75-09-2	Methylene Chloride	5 u
67-64-1	Acetone	10u
75-15-0	Carbon Disulfide	5 u
75-35-4	1, 1-Dichloroethene	5 u
75-34-3	1, 1-Dichloroethane	5 u
156-60-5	Trans-1, 2-Dichloroethene	5 u
67-66-3	Chloroform	5 u
107-06-2	1, 2-Dichloroethane	5 u
78-93-3	2-Butanone	10u
71-55-6	1, 1, 1-Trichloroethane	5 u
56-23-5	Carbon Tetrachloride	5 u
108-05-4	Vinyl Acetate	10u
75-27-4	Bromodichloromethane	5 u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	5 u
10061-02-6	Trans-1, 3-Dichloropropene	5 u
79-01-6	Trichloroethene	5 u
124-48-1	Dibromochloromethane	5 u
79-00-5	1, 1, 2-Trichloroethane	5 u
71-43-2	Benzene	5 u
10061-01-5	cis-1, 3-Dichloropropene	5 u
110-75-8	2-Chloroethylvinylether	10u
75-25-2	Bromoform	5 u
108-10-1	4-Methyl-2-Pentanone	10u
591-78-6	2-Hexanone	10u
127-18-4	Tetrachloroethene	5 u
79-34-5	1, 1, 2, 2-Tetrachloroethane	5 u
108-88-3	Toluene	5 u
108-90-7	Chlorobenzene	5 u
100-41-4	Ethylbenzene	5 u
100-42-5	Styrene	5 u
	Total Xylenes	5 u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used Additional flags or footnotes explaining results are encouraged However, the definition of each flag must be explicit

Value If the result is a value greater than or equal to the detection limit, report the value

U Indicates compound was analyzed for but not detected Report the minimum detection limit for the sample with the U (e g , 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit) The footnote should read U- Compound was analyzed for but not detected The number is the minimum attainable detection limit for the sample

J Indicates an estimated value This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e g , 10J) If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J

C This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides ≥10 ng ul in the final extract should be confirmed by GC/MS

B This flag is used when the analyte is found in the blank as well as a sample It indicates possible/probable blank contamination and warns the data user to take appropriate action

Other Other specific flags and footnotes may be required to properly define the results If used, they must be fully described and such description attached to the data summary report

00017

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 2554

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared 5/9/86

Date Analyzed 5/21/86

Conc./Dil Factor: 1

Percent Moisture (Decanted) N/A

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☒Yes

CAS Number		ug/l or ug/Kg (Circle One)
108-95-2	Phenol	10u
111-44-4	bis(-2-Chloroethyl)Ether	10u
95-57-8	2-Chlorophenol	10u
541-73-1	1 3-Dichlorobenzene	10u
106-46-7	1 4-Dichlorobenzene	10u
100-51-6	Benzyl Alcohol	10u
95-50-1	1 2-Dichlorobenzene	10u
95-48-7	2-Methylphenol	10u
39638-32-9	bis(2-chloroisopropyl)Ether	10u
106-44-5	4-Methylpheno	10u
621-64-7	N-Nitroso-Di-n-Propylamine	10u
67-72-1	Hexachloroethane	10u
98-95-3	Nitrobenzene	10u
78-59-1	Isophorone	10u
88-75-5	2-Nitrophenol	10u
105-67-9	2 4-Dimethylphenol	10u
65-85-0	Benzoic Acid	50u
111-91-1	bis(-2-Chloroethoxy)Methane	10u
120-83-2	2 4-Dichlorophenol	10u
120-82-1	1 2 4-Trichlorobenzene	10u
91-20-3	Naphthalene	10u
106-47-8	4-Chloroaniline	10u
87-68 3	Hexachlorobutadiene	10u
59-50-7	4-Chloro-3-Methylphenol	10u
91-57-6	2-Methylnaphthalene	10u
77-47-4	Hexachlorocyclopentadiene	10u
88-06-2	2 4 6-Trichlorophenol	10u
95-95-4	2 4 5-Trichlorophenol	50u
91-58-7	2-Chloronaphthalene	10u
88-74-4	2-Nitroaniline	50u
131-11-3	Dimethyl Phthalate	10u
208-96-8	Acenaphthylene	10u
99-09-2	3-Nitroaniline	50u

CAS Number		ug/l or ug/Kg (Circle One)
83-32-9	Acenaphthene	10u
51-28-5	2 4-Dinitrophenol	50u
100-02-7	4-Nitrophenol	50u
132-64-9	Dibenzofuran	10u
121-14-2	2 4-Dinitrotoluene	10u
606-20-2	2 6-Dinitrotoluene	10u
84-66-2	Diethylphthalate	10u
7005-72-3	4-Chlorophenyl-phenylether	10u
86-73-7	Fluorene	10u
100-01-6	4-Nitroaniline	50u
534-52-1	4 6-Dinitro-2-Methylphenol	50u
86-30-6	N-Nitrosodiphenylamine (1)	10u
101-55-3	4-Bromophenyl-phenylether	10u
118-74-1	Hexachlorobenzene	10u
87-86-5	Pentachlorophenol	50u
85-01-8	Phenanthrene	10u
120-12-7	Anthracene	10u
84-74-2	Di-n-Butylphthalate	10u
206-44-0	Fluoranthene	10u
129-00-0	Pyrene	10u
85-68-7	Butylbenzylphthalate	10u
91-94-1	3 3'-Dichlorobenzidine	20u
56-55-3	Benzo(a)Anthracene	10u
117-81-7	bis(2-Ethylhexyl)Phthalate	10u
218-01-9	Chrysene	10u
117-84-0	Di-n-Octyl Phthalate	10u
205-99-2	Benzo(b)Fluoranthene	10u
207-08-9	Benzo(k)Fluoranthene	10u
50-32-8	Benzo(a)Pyrene	10u
193-39-5	Indeno(1 2 3-cd)Pyrene	10u
53-70-3	Dibenz(a h)Anthracene	10u
191-24-2	Benzo(g h i)Perylene	10u

(1)-Cannot be separated from diphenylamine

00018

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 654

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared 6/16/86

Date Analyzed 6/17/86

Conc/Dil Factor 1.0

Percent Moisture (decanted) NA

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☑Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	0.05 U
319-85-7	Beta-BHC	0.05 U
319-86-8	Delta-BHC	0.05 U
58-89-9	Gamma-BHC (Lindane)	0.05 U
76-44-8	Heptachlor	0.05 U
309-00-2	Aldrin	0.05 U
1024-57-3	Heptachlor Epoxide	0.05 U
959-98-8	Endosulfan I	0.05 U
60-57-1	Dieldrin	0.10 U
72-55-9	4,4'-DDE	0.10 U
72-20-8	Endrin	0.10 U
33213-65-9	Endosulfan II	0.10 U
72-54-8	4,4'-DDD	0.10 U
1031-07-8	Endosulfan Sulfate	0.10 U
50-29-3	4,4'-DDT	0.10 U
72-43-5	Methoxychlor	0.5 U
53494-70-5	Endrin Ketone	0.10 U
57-74-9	Chlordane	0.5 U
8001-35-2	Toxaphene	1.0 U
12674-11-2	Aroclor-1016	0.5 U
11104-28-2	Aroclor-1221	0.5 U
11141-16-5	Aroclor-1232	0.5 U
53469-21-9	Aroclor-1242	0.5 U
12672-29-6	Aroclor-1248	0.5 U
11097-69-1	Aroclor-1254	1.0 U
11096-82-5	Aroclor-1260	1.0 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s 0.5L 500ml or W_s —— V_t 10,000. V_i 3.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number
PE 0.54

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		2-hexen-1-ol	AFN	5.532	9.9 J
2.		1-chloro-trans-cyclohexanol	↑	8.514	42 J
3.		6,-2-cyclohexen-1-y		9.105	45 J
4.		unknown (hydrocarbon)		10.024	9.6 J
5.		2,4-Azepin-3-one, hexahydro		2 4.25	9.3 J
6.		unknown	V	12.916	10 J
7.		unknown	AFN	24 3.68	8.3 J
8.		11 unknown acetate	↓CA	—	—
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
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18.					
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30.					

00020

Sample Number
BE 655

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc. Case No: 5945

Lab Sample ID No: CLP VOA 821 QC Report No: 101

Sample Matrix: Water Contract No: 68-01-7278

Data Release Authorized By: [illegible] Date Sample Received: 05/07/86

Volatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: NA

Date Analyzed: 5/13/86

Conc/Dil Factor: 1.0 pH 7

Percent Moisture: (Not Decanted) N/A

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	10u
74-83-9	Bromomethane	10u
75-01-4	Vinyl Chloride	10u
75-00-3	Chloroethane	10u
75-09-2	Methylene Chloride RSH	~~5 u 60~~ 54
67-64-1	Acetone	10u C
75-15-0	Carbon Disulfide	5 u
75-35-4	1, 1-Dichloroethene	5 u
75-34-3	1, 1-Dichloroethane	5 u
156-60-5	Trans-1, 2-Dichloroethene	5 u
67-66-3	Chloroform	5 u
107-06-2	1, 2-Dichloroethane	5 u
78-93-3	2-Butanone	10u
71-55-6	1, 1, 1-Trichloroethane	5 u
56-23-5	Carbon Tetrachloride	5 u
108-05-4	Vinyl Acetate	10u
75-27-4	Bromodichloromethane	5 u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	5 u
10061-02-6	Trans-1, 3-Dichloropropene	5 u
79-01-6	Trichloroethene	5 u
124-48-1	Dibromochloromethane	5 u
79-00-5	1, 1, 2-Trichloroethane	5 u
71-43-2	Benzene	5 u
10061-01-5	cis-1, 3-Dichloropropene	5 u
110-75-8	2-Chloroethylvinylether	10u
75-25-2	Bromoform	5 u
108-10-1	4-Methyl-2-Pentanone	10u
591-78-6	2-Hexanone	10u
127-18-4	Tetrachloroethene	5 u
79-34-5	1, 1, 2, 2-Tetrachloroethane	5 u
108-88-3	Toluene	5 u
108-90-7	Chlorobenzene	5 u
100-41-4	Ethylbenzene	5 u
100-42-5	Styrene	5 u
	Total Xylenes	5 u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used Additional flags or footnotes explaining results are encouraged However, the definition of each flag must be explicit

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates compound was analyzed for but not detected Report the minimum detection limit for the sample with the U (e g , 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit) The footnote should read U- Compound was analyzed for but not detected The number is the minimum attainable detection limit for the sample
J	Indicates an estimated value This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e g , 10J) If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J
C	This flag applies to pesticide parameters where the identification has been confirmed by GC-MS Single component pesticides ≥10 ng ul in the final extract should be confirmed by GC/MS
B	This flag is used when the analyte is found in the blank as well as a sample It indicates possible/probable blank contamination and warns the data user to take appropriate action
Other	Other specific flags and footnotes may be required to properly define the results If used, they must be fully described and such description attached to the data summary report

00021

Laboratory Name: Cambridge Analytical Associates

Case No: 5945

Sample Number: BE 655

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: 5/2c/86 *

Date Analyzed: 5/29/86

Conc./Dil Factor: 1

Percent Moisture (Decanted): N/A

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☒Yes

CAS Number		(ug/l or ug/Kg (Circle One))
108-95-2	Phenol	10u
111-44-4	bis(-2-Chloroethyl)Ether	10u
95-57-8	2-Chlorophenol	10u
541-73-1	1 3-Dichlorobenzene	10u
106-46-7	1 4-Dichlorobenzene	10u
100-51-6	Benzyl Alcohol	10u
95-50-1	1 2-Dichlorobenzene	10u
95-48-7	2-Methylphenol	10u
39638-32-9	bis(2-chloroisopropyl)Ether	10u
106-44-5	4-Methylpheno	10u
621-64-7	N-Nitroso-Di-n-Propylamine	10u
67-72-1	Hexachloroethane	10u
98-95-3	Nitrobenzene	10u
78-59-1	Isophorone	10u
88-75-5	2-Nitrophenol	10u
105-67-9	2 4-Dimethylphenol	10u
65-85-0	Benzoic Acid	50u
111-91-1	bis(-2-Chloroethoxyl)Methane	10u
120-83-2	2 4-Dichlorophenol	10u
120-82-1	1 2 4-Trichlorobenzene	10u
91-20-3	Naphthalene	10u
106-47-8	4-Chloroaniline	10u
87-68-3	Hexachlorobutadiene	10u
59-50-7	4-Chloro-3-Methylphenol	10u
91-57-6	2-Methylnaphthalene	10u
77-47-4	Hexachlorocyclopentadiene	10u
88-06-2	2 4 6-Trichlorophenol	10u
95-95-4	2 4 5-Trichlorophenol	50u
91-58-7	2-Chloronaphthalene	10u
88-74-4	2-Nitroaniline	50u
131-11-3	Dimethyl Phthalate	10u
208-96-8	Acenaphthylene	10u
99-09-2	3-Nitroaniline	50u

CAS Number		(ug/l or ug/Kg (Circle One))
83-32-9	Acenaphthene	10u
51-28-5	2 4-Dinitrophenol	50u
100-02-7	4-Nitrophenol	50u
132-64-9	Dibenzofuran	10u
121-14-2	2 4-Dinitrotoluene	10u
606-20-2	2 6-Dinitrotoluene	10u
84-66-2	Diethylphthalate	10u
7005-72-3	4-Chlorophenyl-phenylether	10u
86-73-7	Fluorene	10u
100-01-6	4-Nitroaniline	50u
534-52-1	4 6-Dinitro-2-Methylphenol	50u
86-30-6	N-Nitrosodiphenylamine (1)	10u
101-55-3	4-Bromophenyl-phenylether	10u
118-74-1	Hexachlorobenzene	10u
87-86-5	Pentachlorophenol	50u
85-01-8	Phenanthrene	10u
120-12-7	Anthracene	10u
84-74-2	Di-n-Butylphthalate	10u
206-44-0	Fluoranthene	10u
129-00-0	Pyrene	10u
85-68-7	Butylbenzylphthalate	10u
91-94-1	3 3'-Dichlorobenzidine	20u
56-55-3	Benzo(a)Anthracene	10u
117-81-7	bis(2-Ethylhexyl)Phthalate	10u
218-01-9	Chrysene	10u
117-84-0	Di-n-Octyl Phthalate	10u
205-99-2	Benzo(b)Fluoranthene	10u
207-08-9	Benzo(k)Fluoranthene	10u
50-32-8	Benzo(a)Pyrene	10u
193-39-5	Indeno(1 2 3-cd)Pyrene	10u
53-70-3	Dibenzo(a h)Anthracene	10u
191-24-2	Benzo(g h i)Perylene	10u

(1)-Cannot be separated from diphenylamine

* Re-extraction date, sample was originally extracted on 5/9/86 but QC (surrogates out of limits) triggered re-extraction.

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 655

Organics Analysis Data Sheet (Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared 6/16/88

Date Analyzed 6/17/88

Conc/Dil Factor 1.0

Percent Moisture (decanted) NA

GPC Cleanup ☐Yes ☑No

Separatory Funnel Extraction ☑Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	0.05 U
319-85-7	Beta-BHC	0.05 U
319-86-8	Delta-BHC	0.05 U
58-89-9	Gamma-BHC (Lindane)	0.05 U
76-44-8	Heptachlor	0.05 U
309-00-2	Aldrin	0.05 U
1024-57-3	Heptachlor Epoxide	0.05 U
959-98-8	Endosulfan I	0.05 U
60-57-1	Dieldrin	0.10 U
72-55-9	4,4'-DDE	0.10 U
72-20-8	Endrin	0.10 U
33213-65-9	Endosulfan II	0.10 U
72-54-8	4,4'-DDD	0.10 U
1031-07-8	Endosulfan Sulfate	0.10 U
50-29-3	4,4'-DDT	0.10 U
72-43-5	Methoxychlor	0.5 U
53494-70-5	Endrin Ketone	0.10 U
57-74-9	Chlordane	0.5 U
8001-35-2	Toxaphene	1.0 U
12674-11-2	Aroclor-1016	0.5 U
11104-28-2	Aroclor-1221	0.5 U
11141-16-5	Aroclor-1232	0.5 U
53469-21-9	Aroclor-1242	0.5 U
12672-29-6	Aroclor-1248	0.5 U
11097-69-1	Aroclor-1254	1.0 U
11096-82-5	Aroclor-1260	1.0 U

V_t = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

00023

V_s ~~0.5 0~~ 500 or W_s — V_t 10,000. V_i 3.0

Laboratory Name Cambridge Analytical Associates

Case No

Sample Number

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		1,2-benzisothiazole	BNA	12.88	8.5 J
2.		unknown		20.46	8.5 J
3.		"		22.08	18 J
4.		sulfur		23.05	12 J
5.		unknown		23.57	8.4 J
6.				23.68	13 J
7.				24.54	20 J
8.				24.74	12 J
9.				25.20	9.5 J
10.				25.38	16 J
11.				27.36	16 J
12.				27.52	10 J
13.				28.86	12 J
14.				29.16	12 J
15.		no unknown volatiles	VOA	—	—
16.					
17.					
18.					
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00024

Sample Number
RF 154

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc. Case No: 5045

Lab Sample ID No: Client ID Soil QC1

Sample Matrix: Soil Contract No: 68-01-7278

Data Release Authorized By: [illegible] Date Sample Received: [illegible]

Volatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: [illegible]

Date Analyzed: [illegible]

Conc/Dil Factor: 1.0 pH 7

Percent Moisture: (Not Decanted) 19%

CAS Number		ug/l or (ug/Kg) (Circle One)
74-87-3	Chloromethane	50u
74-83-9	Bromomethane	50u
75-01-4	Vinyl Chloride	50u
75-00-3	Chloroethane	~~50u~~
75-09-2	Methylene Chloride RTH	~~26u~~ 37 B
67-64-1	Acetone	50u
75-15-0	Carbon Disulfide	25u
75-35-4	1, 1-Dichloroethene	25u
75-34-3	1, 1-Dichloroethane	25u
156-60-5	Trans-1, 2-Dichloroethene	25u
67-66-3	Chloroform	25u
107-06-2	1, 2-Dichloroethane	25u
78-93-3	2-Butanone	50u
71-55-6	1, 1, 1-Trichloroethane	25u
56-23-5	Carbon Tetrachloride	25u
108-05-4	Vinyl Acetate	50u
75-27-4	Bromodichloromethane	25u

-154 EL

CAS Number		ug/l or (ug/Kg) (Circle One)
78-87-5	1, 2-Dichloropropane	25u
10061-02-6	Trans-1, 3-Dichloropropene	25u
79-01-6	Trichloroethene	25u
124-48-1	Dibromochloromethane	25u
79-00-5	1, 1, 2-Trichloroethane	25u
71-43-2	Benzene	25u
10061-01-5	cis-1, 3-Dichloropropene	25u
110-75-8	2-Chloroethylvinylether	50u
75-25-2	Bromoform	25u
108-10-1	4-Methyl-2-Pentanone	50u
591-78-6	2-Hexanone	50u
127-18-4	Tetrachloroethene	25u
79-34-5	1, 1, 2, 2-Tetrachloroethane	25u
108-88-3	Toluene	25u
108-90-7	Chlorobenzene	25u
100-41-4	Ethylbenzene	25u
100-42-5	Styrene	25u
	Total Xylenes	25u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used Additional flags or footnotes explaining results are encouraged However, the definition of each flag must be explicit

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates compound was analyzed for but not detected Report the minimum detection limit for the sample with the U (e g , 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit) The footnote should read U- Compound was analyzed for but not detected The number is the minimum attainable detection limit for the sample
J	Indicates an estimated value This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e g , 10J) If limit of detection is 10 µg/l and a concentration of 3 µg l is calculated, report as 3J
C	This flag applies to pesticide parameters where the identification has been confirmed by GC MS Single component pesticides ≥10 ng ul in the final extract should be confirmed by GC/MS
B	This flag is used when the analyte is found in the blank as well as a sample It indicates possible/probable blank contamination and warns the data user to take appropriate action
Other	Other specific flags and footnotes may be required to properly define the results If used, they must be fully described and such description attached to the data summary report

00025

Laboratory Name: Cambridge Analytical Associates

Case No: 5945

Sample Number: BE 656

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: 5/13/86

Date Analyzed: 5/23/86

Conc./Dil Factor: 1

Percent Moisture (Decanted): 18 N/A

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or (ug/Kg) (Circle One)
108-95-2	Phenol	330u
111-44-4	bis(-2-Chloroethyl)Ether	330u
95-57-8	2-Chlorophenol	330u
541-73-1	1 3-Dichlorobenzene	330u
106-46-7	1 4-Dichlorobenzene	330u
100-51-6	Benzyl Alcohol	330u
95-50-1	1 2-Dichlorobenzene	330u
95-48-7	2-Methylphenol	330u
39638-32-9	bis(2-chloroisopropyl)Ether	330u
106-44-5	4-Methylphenol	330u
621-64-7	N-Nitroso-Di-n-Propylamine	330u
67-72-1	Hexachloroethane	330u
98-95-3	Nitrobenzene	330u
78-59-1	Isophorone	330u
88-75-5	2-Nitrophenol	330u
105-67-9	2 4-Dimethylphenol	330u
65-85-0	Benzoic Acid	1600u
111-91-1	bis(-2-Chloroethoxy)Methane	330u
120-83-2	2 4-Dichlorophenol	330u
120-82-1	1 2 4-Trichlorobenzene	330u
91-20-3	Naphthalene	330u
106-47-8	4-Chloroaniline	330u
87-68 3	Hexachlorobutadiene	330u
59-50-7	4-Chloro-3-Methylphenol	330u
91-57-6	2-Methylnaphthalene	330u
77-47-4	Hexachlorocyclopentadiene	330u
88-06-2	2 4 6-Trichlorophenol	330u
95 95-4	2 4 5-Trichlorophenol	1600u
91-58-7	2-Chloronaphthalene	330u
88-74-4	2-Nitroaniline	1600u
131-11-3	Dimethyl Phthalate	330u
208-96-8	Acenaphthylene	330u
99-09-2	3-Nitroaniline	1600u

CAS Number		ug/l or (ug/Kg) (Circle One)
83-32-9	Acenaphthene	330u
51-28-5	2 4-Dinitrophenol	1600u
100-02-7	4-Nitrophenol	1600 u
132-64-9	Dibenzofuran	330u
121-14-2	2 4-Dinitrotoluene	330u
606-20-2	2 6-Dinitrotoluene	330u
84-66-2	Diethylphthalate	330u
7005-72-3	4-Chlorophenyl-phenylether	330u
86-73-7	Fluorene	330u
100-01-6	4-Nitroaniline	330u
534-52-1	4 6-Dinitro-2-Methylphenol	1600u
86-30-6	N-Nitrosodiphenylamine (1)	330u
101-55-3	4-Bromophenyl-phenylether	330u
118-74-1	Hexachlorobenzene	330u
87-86-5	Pentachlorophenol	1600u
85-01-8	Phenanthrene	330u
120-12-7	Anthracene	330u
84-74-2	Di-n-Butylphthalate	330u
206-44-0	Fluoranthene	330u
129-00-0	Pyrene	330u
85-68-7	Butylbenzylphthalate	330u
91-94-1	3 3 -Dichlorobenzidine	660u
56-55-3	Benzo(a)Anthracene	330u
117-81-7	bis(2-Ethylhexyl)Phthalate	330u
218-01-9	Chrysene	330u
117-84-0	Di-n-Octyl Phthalate	330u
205-99-2	Benzo(b)Fluoranthene	330u
207-08-9	Benzo(k)Fluoranthene	330u
50-32-8	Benzo(a)Pyrene	330u
193-39-5	Indeno(1 2 3-cd)Pyrene	330u
53-70-3	Dibenz(a h)Anthracene	330u
191-24-2	Benzo(g h i)Perylene	330u

(1)-Cannot be seperated from diphenylamine

Laboratory Name Cambridge Analytical Associates

Case No [illegible]

Sample Number
AE 050

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared [illegible]

Date Analyzed [illegible]

Conc/Dil Factor 1/20

Percent Moisture (decanted) [illegible]

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	8.0 U
319-85-7	Beta-BHC	8.0 U
319-86-8	Delta-BHC	8.0 U
58-89-9	Gamma-BHC (Lindane)	8.0 U
76-44-8	Heptachlor	8.0 U
309-00-2	Aldrin	8.0 U
1024-57-3	Heptachlor Epoxide	8.0 U
959-98-8	Endosulfan I	8.0 U
60-57-1	Dieldrin	16.0 U
72-55-9	4,4'-DDE	16.0 U
72-20-8	Endrin	16.0 U
33213-65-9	Endosulfan II	16.0 U
72-54-8	4,4'-DDD	16.0 U
1031-07-8	Endosulfan Sulfate	16.0 U
50-29-3	4,4'-DDT	16.0 U
72-43-5	Methoxychlor	80.0 U
53494-70-5	Endrin Ketone	16.0 U
57-74-9	Chlordane	80.0 U
8001-35-2	Toxaphene	160.0 U
12674-11-2	Aroclor-1016	80.0 U
11104-28-2	Aroclor-1221	80.0 U
11141-16-5	Aroclor-1232	80.0 U
53469-21-9	Aroclor-1242	80.0 U
12672-29-6	Aroclor-1248	80.0 U
11097-69-1	Aroclor-1254	160.0 U
11096-82-5	Aroclor-1260	160.0 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s — or W_s 25.2 V_t 1000 V_i 2.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number
BF 656

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT/or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		unknown	ABN	5.731	200 J
2.		unknown		6.856	700 J
3.		unknown		6.345	180 J
4.		unknown		7.453	1700 J
5.		unknown		9,212	1000 J
6.		unknown		11,096	170 J
7.		unknown		24.320	170 J
8.		unknown	↓	32.573	370 J
9.					
10.		no volatile tentatives	VOA	—	—
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
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25.					
26.					
27.					
28.					
29.					
30.					

Sample Number
RF 157

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc. Case No: [illegible]

Lab Sample ID No: [illegible] Soil OC Report No: [illegible]

Sample Matrix: Soil Contract No: 68-01-7278

Data Release Authorized By: [illegible] Date Sample Received: [illegible]

Volatile Compounds

Concentration: Low Medium (Circle One)

Date Extracted/Prepared: [illegible]

Date Analyzed: [illegible]

Conc/Dil Factor: 5.8 pH 7

Percent Moisture: (Not Decanted) [illegible]

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	50u
74-83-9	Bromomethane	50u
75-01-4	Vinyl Chloride	50u
75-00-3	Chloroethane	50u
75-09-2	Methylene Chloride 25J	~~25u~~ 39
67-64-1	Acetone	50u
75-15-0	Carbon Disulfide	25u
75-35-4	1, 1-Dichloroethene	25u
75-34-3	1, 1-Dichloroethane	25u
156-60-5	Trans-1, 2-Dichloroethene	25u
67-66-3	Chloroform	25u
107-06-2	1, 2-Dichloroethane	25u
78-93-3	2-Butanone	50u
71-55-6	1, 1, 1-Trichloroethane	25u
56-23-5	Carbon Tetrachloride	25u
108-05-4	Vinyl Acetate	50u
75-27-4	Bromodichloromethane	25u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	25u
10061-02-6	Trans-1, 3-Dichloropropene	25u
79-01-6	Trichloroethene	25u
124-48-1	Dibromochloromethane	25u
79-00-5	1, 1, 2-Trichloroethane	25u
71-43-2	Benzene	25u
10061-01-5	cis-1, 3-Dichloropropene	25u
110-75-8	2-Chloroethylvinylether	50u
75-25-2	Bromoform	25u
108-10-1	4-Methyl-2-Pentanone	50u
591-78-6	2-Hexanone	50u
127-18-4	Tetrachloroethene	25u
79-34-5	1, 1, 2, 2 Tetrachloroethane	25u
108-88-3	Toluene	25u
108-90-7	Chlorobenzene	25u
100-41-4	Ethylbenzene	25u
100-42-5	Styrene	25u
	Total Xylenes	25u

754 EC

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

00029

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution action. (This is not necessarily the instrument detection limit.) The footnote should read "U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample."

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ml in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

Laboratory Name Cambridge Analytical Associates

Case No. 5645

Sample Number BE 657

Organics Analysis Data Sheet (Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared 5/3/86

Date Analyzed 5/22/86

Conc/Dil Factor: 4

Percent Moisture (Decanted) 14

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
108-95-2	Phenol	1320 U
111-44-4	bis(2-Chloroethyl)Ether	1320 U
95-57-8	2-Chlorophenol	1320 U
541-73-1	1,3-Dichlorobenzene	1320 U
106-46-7	1,4-Dichlorobenzene	1320 U
100-51-6	Benzyl Alcohol	1320 U
95-50-1	1,2-Dichlorobenzene	1320 U
95-48-7	2-Methylphenol	1320 U
39638-32-9	bis(2-chloroisopropyl)Ether	1320 U
106-44-5	4-Methylphenol	1320 U
621-64-7	N-Nitroso Di-n-Propylamine	1320 U
67-72-1	Hexachloroethane	1320 U
98-95-3	Nitrobenzene	1320 U
78-59-1	Isophorone	1320 U
88-75-5	2-Nitrophenol	1320 U
105-67-9	2,4-Dimethylphenol	1320 U
65-85-0	Benzoic Acid	6400 U
111-91-1	bis(2-Chloroethoxy)Methane	1320 U
120-83-2	2,4-Dichlorophenol	1320 U
120-82-1	1,2,4-Trichlorobenzene	1320 U
91-20-3	Naphthalene	1320 U
106-47-8	4-Chloroaniline	1320 U
87-68-3	Hexachlorobutadiene	1320 U
59-50-7	4-Chloro-3-Methylphenol	1320 U
91-57-6	2-Methylnaphthalene	1320 U
77-47-4	Hexachlorocyclopentadiene	1320 U
88-06-2	2,4,6-Trichlorophenol	1320 U
95-95-4	2,4,5-Trichlorophenol	6400 U
91-58-7	2-Chloronaphthalene	1320 U
88-74-4	2-Nitroaniline	6400 U
131-11-3	Dimethyl Phthalate	1320 U
208-96-8	Acenaphthylene	1320 U
99-09-2	3-Nitroaniline	6400 U

CAS Number		ug/l or ug/Kg (Circle One)
83-32-9	Acenaphthene	1320 U
51-28-5	2,4-Dinitrophenol	6400 U
100-02-7	4-Nitrophenol	6400 U
132-64-9	Dibenzofuran	1320 U
121-14-2	2,4-Dinitrotoluene	1320 U
606-20-2	2,6-Dinitrotoluene	1320 U
84-66-2	Diethylphthalate	1320 U
7005-72-3	4-Chlorophenyl-phenylether	1320 U
86-73-7	Fluorene	1320 U
100-01-6	4-Nitroaniline	1320 U
534-52-1	4,6-Dinitro-2-Methylphenol	6400 U
86-30-6	N-Nitrosodiphenylamine (1)	1320 U
101-55-3	4-Bromophenyl-phenylether	1320 U
118-74-1	Hexachlorobenzene	1320 U
87-86-5	Pentachlorophenol	6400 U
85-01-8	Phenanthrene	1320 U
120-12-7	Anthracene	1320 U
84-74-2	Di-n-Butylphthalate	1320 U
206-44-0	Fluoranthene 452 J	~~1320 U~~ 1320 U
129-00-0	Pyrene	1320 U
85-68-7	Butylbenzylphthalate 588 J	~~1320 U~~ 1320 U
91-94-1	3,3-Dichlorobenzidine	2640 U
56-55-3	Benzo(a)Anthracene	1320 U
117-81-7	bis(2-Ethylhexyl)Phthalate	~~1320 U~~ 1320 U
218-01-9	Chrysene	~~1320 U~~ 1320 U
117-84-0	Di-n-Octyl Phthalate	1320 U
205-99-2	Benzo(b)Fluoranthene	1320 U
207-08-9	Benzo(k)Fluoranthene	1320 U
50-32-8	Benzo(a)Pyrene	1320 U
193-39-5	Indeno(1,2,3-cd)Pyrene	1320 U
53-70-3	Dibenz(a,h)Anthracene	1320 U
191-24-2	Benzo(g,h,i)Perylene	1320 U

(1)-Cannot be separated from diphenylamine

01030

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number
BE 052

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared 5/[illegible]

Date Analyzed [illegible]

Conc/Dil Factor 1.0

Percent Moisture (decanted) 19%

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	5.0 U
319-85-7	Beta-BHC	5.0 U
319-86-8	Delta-BHC	5.0 U
58-89-9	Gamma-BHC (Lindane)	5.0 U
76-44-8	Heptachlor	5.0 U
309-00-2	Aldrin	5.0 U
1024-57-3	Heptachlor Epoxide	8.0 U
959-98-8	Endosulfan I	5.0 U
60-57-1	Dieldrin	10.0 U
72-55-9	4,4'-DDE	10.0 U
72-20-8	Endrin	10.0 U
33213-65-9	Endosulfan II	10.0 U
72-54-8	4,4'-DDD	10.0 U
1031-07-8	Endosulfan Sulfate	10.0 U
50-29-3	4,4'-DDT	10.0 U
72-43-5	Methoxychlor	50.0 U
53494-70-5	Endrin Ketone	10.0 U
57-74-9	Chlordane	50.0 U
8001-35-2	Toxaphene	60.0 U
12674-11-2	Aroclor-1016	80.0 U
11104-28-2	Aroclor-1221	80.0 U
11141-16-5	Aroclor-1232	80.0 U
53469-21-9	Aroclor-1242	~~80.0~~ 5700.
12672-29-6	Aroclor-1248	80.0 U
11097-69-1	Aroclor-1254	160.0 U
11096-82-5	Aroclor-1260	200.0 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s — or W_s 24.3 V_t 1000 V_i 3.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 657

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		unknown	ABN	20.70	2CC J
2.		unknown		21.45	56CC J
3.		unknown		21.70	16CC J
4.		unknown		22.39	340C J
5.		unknown		23.82	2700 J
6.		benzenebutanamine (9CI)		24.29	20CCC J
7.		unknown		24.67	360C J
8.		unknown		25.08	2800 J
9.		3,6-dimethyldecane		25.49	530C J
10.		3-nitro 1,2-benzenedicarboxylic acid		25.91	13 000 J
11.		unknown		26.29	6700 J
12.		unknown		27.06	390C J
13.		unknown		27.80	1400 J
14.		pentatriacontane		29.99	3200 J
15.		unknown		30.08	1400 J
16.		unknown		32.45	690C J
17.		unknown		32.94	200C J
18.		unknown		33.58	260C J
19.		unknown		34.27	190C J
20.		unknown	↓	35.56	4700 J
21.		[illegible]	VOA	—	—
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

00032

Sample Number

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc.

Case No:

Lab Sample ID No:

QC Report No:

Sample Matrix: Soil

Contract No: 68-01-7278

Data Release Authorized By:

Date Sample Received:

Volatile Compounds

Concentration: Low Medium (Circle One)

Date Extracted/Prepared:

Date Analyzed:

Conc/Dil Factor: 5.6 pH 7

Percent Moisture: (Not Decanted) 11 %

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	50u
74-83-9	Bromomethane	50u
75-01-4	Vinyl Chloride	50u
75-00-3	Chloroethane	50u
75-09-2	Methylene Chloride RM	~~250~~ 185
67-64-1	Acetone	50u
75-15-0	Carbon Disulfide	25u
75-35-4	1, 1-Dichloroethene	25u
75-34-3	1, 1-Dichloroethane	25u
156-60-5	Trans-1, 2-Dichloroethene	25u
67-66-3	Chloroform	25u
107-06-2	1, 2-Dichloroethane	25u
78-93-3	2-Butanone	50u
71-55-6	1, 1, 1-Trichloroethane	25u
56-23-5	Carbon Tetrachloride	25u
108-05-4	Vinyl Acetate	50u
75-27-4	Bromodichloromethane	25u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	25u
10061-02-6	Trans-1, 3-Dichloropropene	25u
79-01-6	Trichloroethene	25u
124-48-1	Dibromochloromethane	25u
79-00-5	1, 1, 2-Trichloroethane	25u
71-43-2	Benzene	25u
10061-01-5	cis-1, 3-Dichloropropene	25u
110-75-8	2-Chloroethylvinylether	50u
75-25-2	Bromoform	25u
108-10-1	4-Methyl-2-Pentanone	50u
591-78-6	2-Hexanone	50u
127-18-4	Tetrachloroethene	25u
79-34-5	1, 1, 2, 2-Tetrachloroethane	25u
108-88-3	Toluene	25u
108-90-7	Chlorobenzene	25u
100-41-4	Ethylbenzene	25u
100-42-5	Styrene	25u
	Total Xylenes	25u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

00033

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution action. (This is not necessarily the instrument detection limit.) The footnote should read "U - Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample."
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g., 10J). If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J.
C	This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides ≥10 ng/ml in the final extract should be confirmed by GC/MS.
B	This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
Other	Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

Laboratory Name: Cambridge Analytical Associates

Case No: 5945

Sample Number: 5[illegible]

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: 5/13/86

Date Analyzed: 5/23/86

Conc/Dil Factor: 2

Percent Moisture (Decanted): 11

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or (ug/Kg) (Circle One)
108-95-2	Phenol	660 U
111-44-4	bis(2-Chloroethyl)Ether	660 U
95-57-8	2-Chlorophenol	660 U
541-73-1	1,3-Dichlorobenzene	660 U
106-46-7	1,4-Dichlorobenzene	660 U
100-51-6	Benzyl Alcohol	660 U
95-50-1	1,2-Dichlorobenzene	660 U
95-48-7	2-Methylphenol	660 U
39638-32-9	bis(2-chloroisopropyl)Ether	660 U
106-44-5	4-Methylpheno	660 U
621-64-7	N-Nitroso-Di-n-Propylamine	660 U
67-72-1	Hexachloroethane	660 U
98 95-3	Nitrobenzene	660 U
78-59-1	Isophorone	660 U
88-75-5	2-Nitrophenol	660 U
105-67-9	2,4-Dimethylphenol	660 U
65-85-0	Benzoic Acid	3200 U
111-91-1	bis(2-Chloroethoxy)Methane	660 U
120-83-2	2,4-Dichlorophenol	660 U
120-82-1	1,2,4-Trichlorobenzene	660 U
91-20-3	Naphthalene	660 U
106-47-8	4-Chloroaniline	660 U
87-68-3	Hexachlorobutadiene	660 U
59-50-7	4-Chloro-3-Methylphenol	660 U
91-57-6	2-Methylnaphthalene	660 U
77-47-4	Hexachlorocyclopentadiene	660 U
88-06-2	2,4,6-Trichlorophenol	660 U
95 95-4	2,4,5-Trichlorophenol	3200 U
91-58-7	2-Chloronaphthalene	660 U
88-74-4	2-Nitroaniline	3200 U
131-11-3	Dimethyl Phthalate	660 U
208-96-8	Acenaphthylene	660 U
99-09-2	3-Nitroaniline	3200 U

CAS Number		ug/l or (ug/Kg) (Circle One)
83-32-9	Acenaphthene	660 U
51-28-5	2,4-Dinitrophenol	3200 U
100-02-7	4-Nitrophenol	3200 U
132-64-9	Dibenzofuran	660 U
121-14-2	2,4-Dinitrotoluene	660 U
606-20-2	2,6-Dinitrotoluene	660 U
84-66-2	Diethylphthalate	660 U
7005-72-3	4-Chlorophenyl-phenylether	660 U
86-73-7	Fluorene	660 U
100-01-6	4-Nitroaniline	660 U
534-52-1	4,6-Dinitro-2-Methylphenol	3200 U
86-30-6	N-Nitrosodiphenylamine (1)	660 U
101-55-3	4-Bromophenyl-phenylether	660 U
118-74-1	Hexachlorobenzene	660 U
87-86-5	Pentachlorophenol	3200 U
85-01-8	Phenanthrene	660 U 250 J
120-12-7	Anthracene	660 U
84-74-2	Di-n-Butylphthalate	660 U
206-44-0	Fluoranthene	660 U 440 J
129-00-0	Pyrene	660 U 570 J
85-68-7	Butylbenzylphthalate	660 U
91-94-1	3,3'-Dichlorobenzidine	1320 U
56-55-3	Benzo(a)Anthracene	660 U 770 J
117-81-7	bis(2-Ethylhexyl)Phthalate	660 U
218-01-9	Chrysene 1400	660 U
117-84-0	Di-n-Octyl Phthalate	660 U
205-99-2	Benzo(b)Fluoranthene	660 U
207-08-9	Benzo(k)Fluoranthene	660 U
50-32-8	Benzo(a)Pyrene 720	660 U
193-39-5	Indeno(1,2,3-cd)Pyrene	660 U
53-70-3	Dibenz(a,h)Anthracene	660 U 330 J
191-24-2	Benzo(g,h,i)Perylene 490	660 U

(1)-Cannot be separated from diphenylamine

Laboratory Name Cambridge Analytical Associates

Case No 5445

Sample Number BE 0[illegible]

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared [illegible]

Date Analyzed [illegible]

Conc/Dil Factor 20

Percent Moisture (decanted) [illegible]

GPC Cleanup ☐Yes ☑No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or (ug/Kg) (Circle One)	
319-84-6	Alpha-BHC	[illegible]	62.2
319-85-7	Beta-BHC	5.0 U	
319-86-8	Delta-BHC	5.0 U	
58-89-9	Gamma-BHC (Lindane)	[illegible]	19.4
76-44-8	Heptachlor	5.0 U	
309-00-2	Aldrin	5.0 U	
1024-57-3	Heptachlor Epoxide	5.0 U	
959-98-8	Endosulfan I	5.0 U	
60-57-1	Dieldrin	10.0 U	
72-55-9	4,4'-DDE	10.0 U	
72-20-8	Endrin	10.0 U	
33213-65-9	Endosulfan II	10.0 U	
72-54-8	4,4'-DDD	10.0 U	
1031-07-8	Endosulfan Sulfate	10.0 U	
50-29-3	4,4'-DDT	10.0 U	
72-43-5	Methoxychlor	50.0 U	
53494-70-5	Endrin Ketone	10.0 U	
57-74-9	Chlordane	50.0 U	
8001-35-2	Toxaphene	100.0 U	
12674-11-2	Aroclor-1016	80.0 U	
11104-28-2	Aroclor-1221	50.0 U	
11141-16-5	Aroclor-1232	50.0 U	
53469-21-9	Aroclor-1242	50.0 U	
12672-29-6	Aroclor-1248	50.0 U	
11097-69-1	Aroclor-1254	100.0 U	
11096-82-5	Aroclor-1260	100.0 U	

00035

V_t = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s — or W_s 27.1 V_t 1000 V_i 5.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number
AE 058

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		unknown	AEN	5.80	411 J
2.		unknown		9.16	1100 J
3.		unknown		20.72	1100 J
4.		Molecular Sulfur		21.50	1100 J
5.		unknown		21.55	7100 J
6.				22.41	1600 J
7.				24.41	1200 J
8.				25.15	7300 J
9.				25.51	3500 J
10.				26.29	2000 J
11.				27.05	11000 J
12.		unknown		27.79	3700 J
13.				29.96	6200 J
14.				30.05	7700 J
15.				32.44	15000 J
16.				32.66	3900 J
17.		unknown		33.15	3700 J
18.				33.51	7000 J
19.				34.26	6700 J
20.			✓	35.61	16000 J
21.		no volatiles	~~VGN~~	—	—
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

00036

Sample Number
RE [illegible]

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc. Case No: 5945

Lab Sample ID No: [illegible] QC Report No: SO1

Sample Matrix: Soil Contract No: 68-01-7278

Data Release Authorized By: [illegible] Date Sample Received: [illegible]

Volatile Compounds

Concentration: Low Medium (Circle One)

Date Extracted/Prepared: [illegible]

Date Analyzed: [illegible]

Conc/Dil Factor: 5.3 pH 7

Percent Moisture: (Not Decanted) 5.0%

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	50u
74-83-9	Bromomethane	50u
75-01-4	Vinyl Chloride	50u
75-00-3	Chloroethane	50u
75-09-2	Methylene Chloride	25u 75.5
67-64-1	Acetone	50u
75-15-0	Carbon Disulfide	25u
75-35-4	1, 1-Dichloroethene	25u
75-34-3	1, 1-Dichloroethane	25u
156-60-5	Trans-1, 2-Dichloroethene	25u
67-66-3	Chloroform	25u
107-06-2	1, 2-Dichloroethane	25u
78-93-3	2-Butanone	50u
71-55-6	1, 1, 1-Trichloroethane	25u
56-23-5	Carbon Tetrachloride	25u
108-05-4	Vinyl Acetate	50u
75-27-4	Bromodichloromethane	25u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	25u
10061-02-6	Trans-1, 3-Dichloropropene	25u
79-01-6	Trichloroethene	25u
124-48-1	Dibromochloromethane	25u
79-00-5	1, 1, 2-Trichloroethane	25u
71-43-2	Benzene	25u
10061-01-5	cis-1, 3-Dichloropropene	25u
110-75-8	2-Chloroethylvinylether	50u
75-25-2	Bromoform	25u
108-10-1	4-Methyl-2-Pentanone	50u
591-78-6	2-Hexanone	50u
127-18-4	Tetrachloroethene	25u
79-34-5	1, 1, 2, 2-Tetrachloroethane	25u
108-88-3	Toluene	25u
108-90-7	Chlorobenzene	25u
100-41-4	Ethylbenzene	25u
100-42-5	Styrene	25u
	Total Xylenes	25u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used Additional flags or footnotes explaining results are encouraged However, the definition of each flag must be explicit

00037

Value	If the result is a value greater than or equal to the detection limit, report the value
U	Indicates compound was analyzed for but not detected Report the minimum detection limit for the sample with the U (e g , 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit) The footnote should read U- Compound was analyzed for but not detected The number is the minimum attainable detection limit for the sample
J	Indicates an estimated value This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e g , 10J) If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J
C	This flag applies to pesticide parameters where the identification has been confirmed by GC MS Single component pesticides ≥10 ng ul in the final extract should be confirmed by GC/MS
B	This flag is used when the analyte is found in the blank as well as a sample It indicates possible/probable blank contamination and warns the data user to take appropriate action
Other	Other specific flags and footnotes may be required to properly define the results If used, they must be fully described and such description attached to the data summary report

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number
BE 659

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared 5/13/86

Date Analyzed 5/23/86

Conc./Dil Factor: 1

Percent Moisture (Decanted) 5 N/A sev.

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or (ug/Kg) (Circle One)
108-95-2	Phenol	330u
111-44-4	bis(2-Chloroethyl)Ether	330u
95-57-8	2-Chlorophenol	330u
541-73-1	1,3-Dichlorobenzene	330u
106-46-7	1,4-Dichlorobenzene	330u
100-51-6	Benzyl Alcohol	330u
95-50-1	1,2-Dichlorobenzene	330u
95-48-7	2-Methylphenol	330u
39638-32-9	bis(2-chloroisopropyl)Ether	330u
106-44-5	4-Methylphenol	330u
621-64-7	N-Nitroso-Di-n-Propylamine	330u
67-72-1	Hexachloroethane	330u
98-95-3	Nitrobenzene	330u
78-59-1	Isophorone	330u
88-75-5	2-Nitrophenol	330u
105-67-9	2,4-Dimethylphenol	330u
65-85-0	Benzoic Acid	1600u
111-91-1	bis(2-Chloroethoxy)Methane	330u
120-83-2	2,4-Dichlorophenol	330u
120-82-1	1,2,4-Trichlorobenzene	330u
91-20-3	Naphthalene	330u
106-47-8	4-Chloroaniline	330u
87-68-3	Hexachlorobutadiene	330u
59-50-7	4-Chloro-3-Methylphenol	330u
91-57-6	2-Methylnaphthalene	330u
77-47-4	Hexachlorocyclopentadiene	330u
88-06-2	2,4,6-Trichlorophenol	330u
95-95-4	2,4,5-Trichlorophenol	1600u
91-58-7	2-Chloronaphthalene	330u
88-74-4	2-Nitroaniline	1600u
131-11-3	Dimethyl Phthalate	330u
208-96-8	Acenaphthylene	330u
99-09-2	3-Nitroaniline	1600u

CAS Number		ug/l or (ug/Kg) (Circle One)
83-32-9	Acenaphthene	~~330u~~ 150J
51-28-5	2,4-Dinitrophenol	1600u
100-02-7	4-Nitrophenol	1600 u
132-64-9	Dibenzofuran	~~330u~~ 97J
121-14-2	2,4-Dinitrotoluene	330u
606-20-2	2,6-Dinitrotoluene	330u
84-66-2	Diethylphthalate	330u
7005-72-3	4-Chlorophenyl-phenylether	330u
86-73-7	Fluorene	~~330u~~ 160J
100-01-6	4-Nitroaniline	330u
534-52-1	4,6-Dinitro-2-Methylphenol	1600u
86-30-6	N-Nitrosodiphenylamine (1)	330u
101-55-3	4-Bromophenyl-phenylether	330u
118-74-1	Hexachlorobenzene	330u
87-86-5	Pentachlorophenol	1600u
85-01-8	Phenanthrene	~~330u~~ 1300
120-12-7	Anthracene	~~330u~~ 490
84-74-2	Di-n-Butylphthalate	~~330u~~ 230J
206-44-0	Fluoranthene	~~330u~~ 1400
129-00-0	Pyrene	~~330u~~ 1600
85-68-7	Butylbenzylphthalate	330u
91-94-1	3,3'-Dichlorobenzidine	660u
56-55-3	Benzo(a)Anthracene	~~330u~~ 870
117-81-7	bis(2-Ethylhexyl)Phthalate	~~330u~~ 350J
218-01-9	Chrysene	~~330u~~ 870
117-84-0	Di-n-Octyl Phthalate	330u
205-99-2	Benzo(b)Fluoranthene	~~330u~~ 2400
207-08-9	Benzo(k)Fluoranthene	330u
50-32-8	Benzo(a)Pyrene	~~330u~~ 490
193-39-5	Indeno(1,2,3-cd)Pyrene	330u
53-70-3	Dibenz(a,h)Anthracene	330u
191-24-2	Benzo(g,h,i)Perylene	330u

* Not detected at value

(1)-Cannot be separated from diphenylamine

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number SE 079

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared 5/4/90 5/10/90

Date Analyzed 5/10/90

Conc/Dil Factor 20

Percent Moisture (decanted) 5.0

GPC Cleanup ☐Yes ☑No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	8.0 U
319-85-7	Beta-BHC	8.0 U
319-86-8	Delta-BHC	8.0 U
58-89-9	Gamma-BHC (Lindane)	8.0 U
76-44-8	Heptachlor	8.0 U
309-00-2	Aldrin	8.0 U
1024-57-3	Heptachlor Epoxide	8.0 U
959-98-8	Endosulfan I	8.0 U
60-57-1	Dieldrin	16.0 U
72-55-9	4,4'-DDE	16.0 U
72-20-8	Endrin	16.0 U
33213-65-9	Endosulfan II	16.0 U
72-54-8	4,4'-DDD	16.0 U
1031-07-8	Endosulfan Sulfate	16.0 U
50-29-3	4,4'-DDT	16.0 U
72-43-5	Methoxychlor	80.0 U
53494-70-5	Endrin Ketone	160.0 U
57-74-9	Chlordane	80.0 U
8001-35-2	Toxaphene	800.0 U
12674-11-2	Aroclor-1016	80.0 U
11104-28-2	Aroclor-1221	80.0 U
11141-16-5	Aroclor-1232	80.0 U
53469-21-9	Aroclor-1242	80.0 U
12672-29-6	Aroclor-1248	80.0 U
11097-69-1	Aroclor-1254	160.0 U
11096-82-5	Aroclor-1260	160.0 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

05039

V_s — or W_s 30.5 V_t 1000 V_i 3.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 659

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		unknown	ABN	20.33	580 J
2.		unknown		20.76	1700 J
3.		Sulfur, molecular		21.63	10000 J
4.		unknown		24.70	1200 J
5.				25.15	990 J
6.				25.51	1000 J
7.				26.29	1900 J
8.				27.06	6900 J
9.				27.35	3000 J
10.				27.80	3400 J
11.				28.53	7800 J
12.				29.99	4700 J
13.		"		30.08	4300 J
14.		unknown		30.93	3800 J
15.		unknown		31.44	2800 J
16.		unknown		31.60	2800 J
17.		unknown		32.52	6500 J
18.		unknown		32.97	3400 J
19.		unknown		34.37	3400 J
20.		di	✓	35.74	11000 J
21.		Methylene Chloride	VOA	—	—
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

00040

Sample Number
BE ECC

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: Cambridge Analytical Assoc.
Case No: 5945
Lab Sample ID No: CEPLEA 822
QC Report No: 101
Sample Matrix: Water
Contract No: 68-01-7278
Data Release Authorized By: [illegible]
Date Sample Received: 05/07/EC

Volatile Compounds

Concentration: (Low) Medium (Circle One)
Date Extracted/Prepared: NA
Date Analyzed: 5/13/EC
Conc/Dil Factor: 1.0 pH 7
Percent Moisture: (Not Decanted) N/A

CAS Number		ug/l or ug/Kg (Circle One)
74-87-3	Chloromethane	10u
74-83-9	Bromomethane	10u
75-01-4	Vinyl Chloride	10u
75-00-3	Chloroethane	10u
75-09-2	Methylene Chloride	5 u
67-64-1	Acetone	10u
75-15-0	Carbon Disulfide	5 u
75-35-4	1, 1-Dichloroethene	5 u
75-34-3	1, 1-Dichloroethane	5 u
156-60-5	Trans-1, 2-Dichloroethene	5 u
67-66-3	Chloroform	5 u
107-06-2	1, 2-Dichloroethane	5 u
78-93-3	2-Butanone	10u
71-55-6	1, 1, 1-Trichloroethane	5 u
56-23-5	Carbon Tetrachloride	5 u
108-05-4	Vinyl Acetate	10u
75-27-4	Bromodichloromethane	5 u

CAS Number		ug/l or ug/Kg (Circle One)
78-87-5	1, 2-Dichloropropane	5 u
10061-02-6	Trans-1, 3-Dichloropropene	5 u
79-01-6	Trichloroethene	5 u
124-48-1	Dibromochloromethane	5 u
79-00-5	1, 1, 2-Trichloroethane	5 u
71-43-2	Benzene	5 u
10061-01-5	cis-1, 3-Dichloropropene	5 u
110-75-8	2-Chloroethylvinylether	10u
75-25-2	Bromoform	5 u
108-10-1	4-Methyl-2-Pentanone	10u
591-78-6	2-Hexanone	10u
127-18-4	Tetrachloroethene	5 u
79-34-5	1, 1, 2, 2-Tetrachloroethane	5 u
108-88-3	Toluene	5 u
108-90-7	Chlorobenzene	5 u
100-41-4	Ethylbenzene	5 u
100-42-5	Styrene	5 u
	Total Xylenes	5 u

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used Additional flags or footnotes explaining results are encouraged However, the definition of each flag must be explicit

00041

Value — If the result is a value greater than or equal to the detection limit, report the value

U — Indicates compound was analyzed for but not detected Report the minimum detection limit for the sample with the U (e g , 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit) The footnote should read U- Compound was analyzed for but not detected The number is the minimum attainable detection limit for the sample

J — Indicates an estimated value This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e g , 10J) If limit of detection is 10 µg/l and a concentration of 3 µg/l is calculated, report as 3J

C — This flag applies to pesticide parameters where the identification has been confirmed by GC-MS Single component pesticides ≥10 ng ul in the final extract should be confirmed by GC/MS

B — This flag is used when the analyte is found in the blank as well as a sample It indicates possible/probable blank contamination and warns the data user to take appropriate action

Other — Other specific flags and footnotes may be required to properly define the results If used, they must be fully described and such description attached to the data summary report

Laboratory Name: Cambridge Analytical Associates

Case No: 5945

Sample Number: BE 660

Organics Analysis Data Sheet
(Page 2)

Semivolatile Compounds

Concentration: (Low) Medium (Circle One)

Date Extracted/Prepared: 5/2/86 *

Date Analyzed: 5/22/86

Conc/Dil Factor: 1

Percent Moisture (Decanted): N/A

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☐Yes

Continuous Liquid - Liquid Extraction ☒Yes

CAS Number		ug/l (or ug/Kg) (Circle One)
108-95-2	Phenol	10u
111-44-4	bis(-2-Chloroethyl)Ether	10u
95-57-8	2-Chlorophenol	10u
541-73-1	1 3-Dichlorobenzene	10u
106-46-7	1 4-Dichlorobenzene	10u
100-51-6	Benzyl Alcohol	10u
95-50-1	1 2-Dichlorobenzene	10u
95-48-7	2-Methylphenol	10u
39638-32-9	bis(2-chloroisopropyl)Ether	10u
106-44-5	4-Methylpheno	10u
621-64-7	N-Nitroso-Di-n-Propylamine	10u
67-72-1	Hexachloroethane	10u
98-95-3	Nitrobenzene	10u
78-59-1	Isophorone	10u
88-75-5	2-Nitrophenol	10u
105-67-9	2 4-Dimethylphenol	10u
65-85-0	Benzoic Acid	50u
111-91-1	bis(-2-Chloroethoxy)Methane	10u
120-83-2	2 4-Dichlorophenol	10u
120-82-1	1 2 4-Trichlorobenzene	10u
91-20-3	Naphthalene	10u
106-47-8	4-Chloroaniline	10u
87-68-3	Hexachlorobutadiene	10u
59-50-7	4-Chloro-3-Methylphenol	10u
91-57-6	2-Methylnaphthalene	10u
77-47-4	Hexachlorocyclopentadiene	10u
88-06-2	2 4 6-Trichlorophenol	10u
95-95-4	2 4 5-Trichlorophenol	50u
91-58-7	2-Chloronaphthalene	10u
88-74-4	2-Nitroaniline	50u
131-11-3	Dimethyl Phthalate	10u
208-96-8	Acenaphthylene	10u
99-09-2	3-Nitroaniline	50u

CAS Number		ug/l (or ug/Kg) (Circle One)
83-32-9	Acenaphthene	10u
51-28-5	2 4-Dinitrophenol	50u
100-02-7	4-Nitrophenol	50u
132-64-9	Dibenzofuran	10u
121-14-2	2 4-Dinitrotoluene	10u
606-20-2	2 6-Dinitrotoluene	10u
84-66-2	Diethylphthalate	10u
7005-72-3	4-Chlorophenyl-phenylether	10u
86-73-7	Fluorene	10u
100-01-6	4-Nitroaniline	50u
534-52-1	4 6-Dinitro-2-Methylphenol	50u
86-30-6	N-Nitrosodiphenylamine (1)	10u
101-55-3	4-Bromophenyl-phenylether	10u
118-74-1	Hexachlorobenzene	10u
87-86-5	Pentachlorophenol	50u
85-01-8	Phenanthrene	10u
120-12-7	Anthracene	10u
84-74-2	Di-n-Butylphthalate	10u
206-44-0	Fluoranthene	10u
129-00-0	Pyrene	10u
85-68-7	Butylbenzylphthalate	10u
91-94-1	3 3'-Dichlorobenzidine	20u
56-55-3	Benzo(a)Anthracene	10u
117-81-7	bis(2-Ethylhexyl)Phthalate	10u
218-01-9	Chrysene	10u
117-84-0	Di-n-Octyl Phthalate	10u
205-99-2	Benzo(b)Fluoranthene	10u
207-08-9	Benzo(k)Fluoranthene	10u
50-32-8	Benzo(a)Pyrene	10u
193-39-5	Indeno(1 2 3-cd)Pyrene	10u
53-70-3	Dibenzo(a h)Anthracene	10u
191-24-2	Benzo(g h i)Perylene	10u

(1)-Cannot be separated from diphenylamine

* Re extraction date, sample was originally extracted 5/9/86, however GC problems (interference) triggered re-extraction

Laboratory Name Cambridge Analytical Associates

Case No 5745

Sample Number
BE 660

Organics Analysis Data Sheet
(Page 3)

Pesticide/PCBs

Concentration (Low) Medium (Circle One)

Date Extracted/Prepared 6/16/86

Date Analyzed 6/17/86

Conc/Dil Factor 1.0

Percent Moisture (decanted) 0.2

GPC Cleanup ☐Yes ☒No

Separatory Funnel Extraction ☒Yes

Continuous Liquid - Liquid Extraction ☐Yes

CAS Number		ug/l or ug/Kg (Circle One)
319-84-6	Alpha-BHC	0.05 U
319-85-7	Beta-BHC	0.05 U
319-86-8	Delta-BHC	0.05 U
58-89-9	Gamma-BHC (Lindane)	0.05 U
76-44-8	Heptachlor	0.05 U
309-00-2	Aldrin	0.05 U
1024-57-3	Heptachlor Epoxide	0.05 U
959-98-8	Endosulfan I	0.05 U
60-57-1	Dieldrin	0.10 U
72-55-9	4,4'-DDE	0.10 U
72-20-8	Endrin	0.10 U
33213-65-9	Endosulfan II	0.10 U
72-54-8	4,4'-DDD	0.10 U
1031-07-8	Endosulfan Sulfate	0.10 U
50-29-3	4,4'-DDT	0.10 U
72-43-5	Methoxychlor	0.5 U
53494-70-5	Endrin Ketone	0.10 U
57-74-9	Chlordane	0.5 U
8001-35-2	Toxaphene	1.0 U
12674-11-2	Aroclor-1016	0.5 U
11104-28-2	Aroclor-1221	0.5 U
11141-16-5	Aroclor-1232	0.5 U
53469-21-9	Aroclor-1242	0.5 U
12672-29-6	Aroclor-1248	0.5 U
11097-69-1	Aroclor-1254	1.0 U
11096-82-5	Aroclor-1260	1.0 U

V_i = Volume of extract injected (ul)

V_s = Volume of water extracted (ml)

W_s = Weight of sample extracted (g)

V_t = Volume of total extract (ul)

V_s 500 or W_s — V_t 10,000. V_i 3.0

Laboratory Name Cambridge Analytical Associates

Case No 5945

Sample Number BE 660

Organics Analysis Data Sheet
(Page 4)

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		2-methyl-Propane	VOA	95	52 J
2.					
3.		unknown	ABN	4.94	8.3 J
4.		unknown	ABN	7.67	13 J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

TABLE 1

SAMPLE DESCRIPTIONS
STAR SAND AND GRAVEL
KINGS PARK, NEW YORK

Sample ID Number	Sample Type	Traffic Report #	Time	Sample Location
NYK9-GW1	Organic Aqueous Inorganic Aqeuous	BE654 MBG026	1130	From 58' deep well at northwest section of site. Well is 100' north of current landfill area.
NYK9-GW2	Organic Aqueous Inorganic Aqueous	BE655 MBG027	1248	From 63' deep well east about 150' from well used for obtaining sample GW1.
NYK9-S1	Organic Soil Inorganic Soil	BE656 MBG022	1354	Subsurface soil sample is taken at bottom of pit and about 20' south of the edge of fill material (see map). Sample taken from 2½' depth. Sample was moist, suggesting that the water table was hit.
NYK9-S2	Organic Soil Inorganic Soil	BE657 MBG023	1410	Subsurface soil sample taken on top of fill material. Sample is 50' north from the edge of fill material. Sample was taken at 1' in depth.
NYK9-S3	Organic Soil Inorganic Soil	BE658 MBG024	1435	Subsurface soil sample taken at western edge of fill material. Sample taken at 1' in depth.
NYK9-S4	Organic Soil Inorganic Soil	BE659 MBG025	1455	Subsurface soil sample taken at a depth of 1'. Sample is about 50' east of current pit area and is on top of an old fill area.
NYK9-B1	Organic Blank Inorganic Blank	BE660 MBG028	N/A	U.S. EPA Laboratories, Edison, New Jersey.

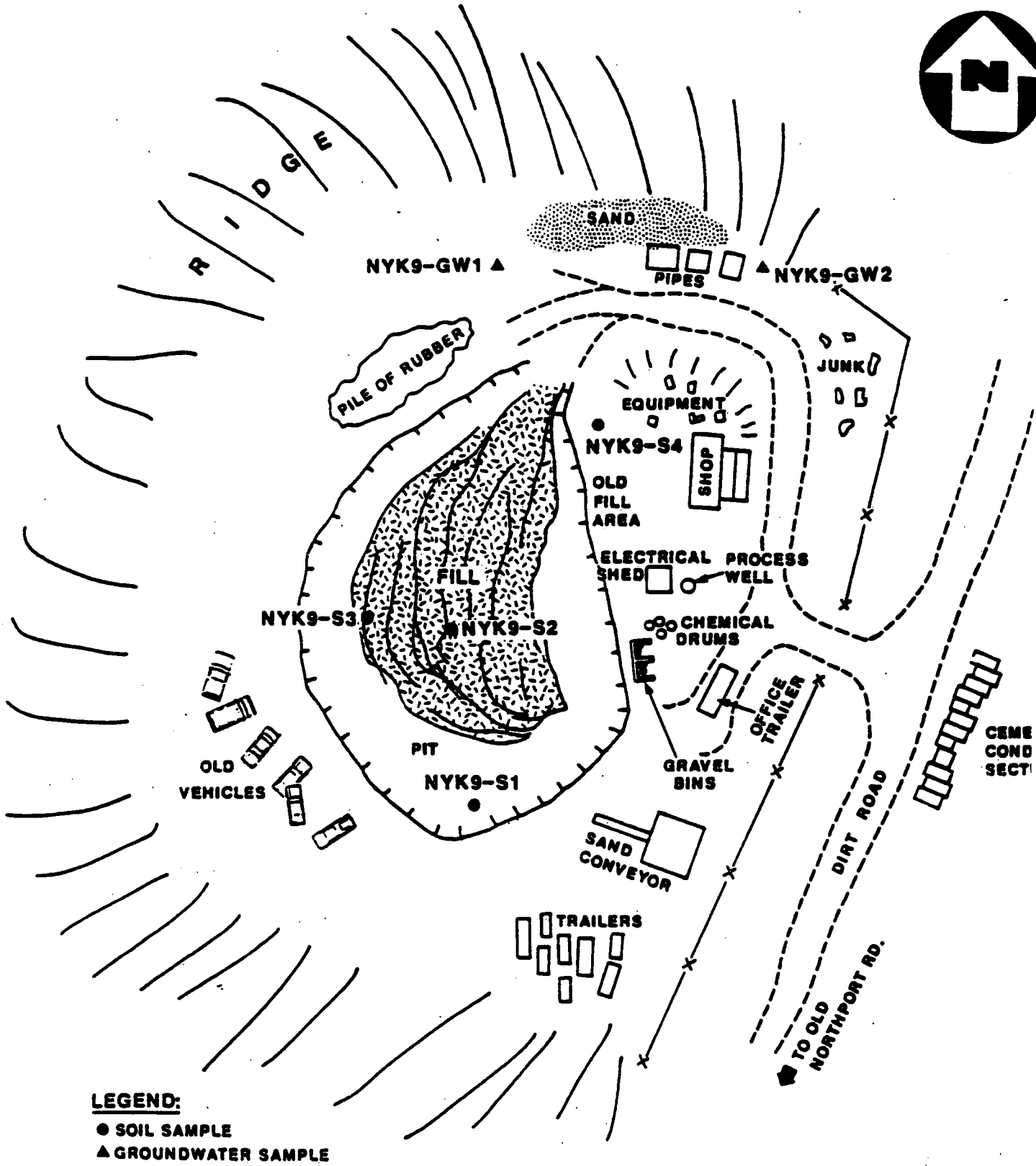


FIGURE 2

SAMPLE LOCATION MAP

STAR SAND AND GRAVEL, KINGS PARK, N.Y.

(NOT TO SCALE)

NUS CORPORATION

A Halliburton Company

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 022
DATE:6-6-86

CC 1

INORGANIC ANALYSIS SHEET

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3982

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM:
MATRIX: SOIL: XX

ELEMENTS..METHOD		MG/KG DRY WEIGHT	
1. ALUMINIUM...P		2963	*
2. ANTIMONY....P		12U	
3. ARSENIC.....F		6.2U	R
4. BARIUM......P	[	21]	E
5. BERYLLIUM...P	[	0.5]	
6. CADMIUM.....P		1.9U	
7. CALCIUM.....P	[	~~102~~]	E
8. CHROMIUM....P		8	
9. COBALT......P	[	5]	
10.COPPER......P	[	4]	
11.IRON........P		5830	*
12.LEAD........F		3.1U	
13.MAGNESIUM...P	[	797]	E
14.MANGANESE...P		100	
15.MERCURY....CV		0.1U	
16.NICKEL......P		11U	
17.POTASSIUM...P	[	1484]	
18.SELENIUM....F		3.1U	R
19.SILVER......P	[	~~2.3~~]	
20.SODIUM......P		10U	E
21.THALLIUM....F		6U	
22.TIN.........P		12U	
23.VANADIUM....P	[	~~12.3~~]	
24.ZINC........P		14	E
25.CYANIDE.....C		N/R	
% SOLID		81	

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 023
DATE:6-6-86

INORGANIC ANALYSIS SHEET

CC 2

LAB NAME: CALIF.ANAL.LAB.
SOW NO.: 784
LAB.SAMPLE NO.: P3983

CASE NO:5945
QC RPT.#5945

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM:
MATRIX: SOIL: XX

ELEMENTS..METHOD		MG/KG		DRY WEIGHT
1. ALUMINIUM...P		3729		*
2. ANTIMONY....P		11U		
3. ARSENIC.....F		5.9U		R
4. BARIUM.....P	[	32]	E	
5. BERYLLIUM...P	[	~~0.1~~]		
6. CADMIUM.....P		1.8U		
7. CALCIUM.....P	[	2021]	E	
8. CHROMIUM....P		9		
9. COBALT.....P		2		
10.COPPER.....P		16		
11.IRON.....P		5699		*
12.LEAD.....P		62		
13.MAGNESIUM...P	[	724]	E	
14.MANGANESE...P		85		
15.MERCURY....CV		0.1U		
16.NICKEL.....P		11U		
17.POTASSIUM...P	[	1039]		
18.SELENIUM....F		2.9U		R
19.SILVER.....P	[	1.8]		
20.SODIUM.....P		9U	E	
21.THALLIUM....F		6U		
22.TIN.....P		11U		
23.VANADIUM....P	[	12.4]		
24.ZINC.....P		48	E	
25.CYANIDE.....C		N/R		
% SOLID		85		

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 024
DATE:6-6-86

QC 3

INORGANIC ANALYSIS SHEET

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3984

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM:
MATRIX: SOIL: XX

ELEMENTS..METHOD		MC KG		DRY WEIGHT
1. ALUMINIUM...P		4181		*
2. ANTIMONY....P		11U		
3. ARSENIC.....F		5.6U	R	
4. BARIUM......P	[	31]	E	
5. BERYLLIUM...P	[	0.3]		
6. CADMIUM.....P		1.7U		
7. CALCIUM.....P		5380	E	
8. CHROMIUM....P		9		
9. COBALT......P	[	2]		
10.COPPER......P		16		
11.IRON........P		7039		*
12.LEAD........P		55		
13.MAGNESIUM...P	[	1164]	E	
14.MANGANESE...P		132		
15.MERCURY....CV		0.1U		
16.NICKEL......P		10U		
17.POTASSIUM...P	[	1178]		
18.SELENIUM....F		2.8U	R	
19.SILVER......P	[	2.4]		
20.SODIUM......P	[	14]	E	
21.THALLIUM....F		6U		
22.TIN.........P		11U		
23.VANADIUM....P	[	13.6]		
24.ZINC........P		100	E	
25.CYANIDE.....C		N/R		
% SOLID		90		

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 025
DATE:6-6-86

INORGANIC ANALYSIS SHEET

OC 4

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3985

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM:
MATRIX: SOIL: XX

ELEMENTS..METHOD		MG/KG		DRY WEIGHT
1. ALUMINIUM...P		3726		*
2. ANTIMONY....P		10U		
3. ARSENIC.....F		5.4U		R
4. BARIUM......P	[	57]	E	
5. BERYLLIUM...P	[	0.3]		
6. CADMIUM.....P		1.6U		
7. CALCIUM.....P		5235	E	
8. CHROMIUM....P		8		
9. COBALT......P	[	2]		
10.COPPER......P		16		
11.IRON........P		6930		*
12.LEAD........P		97		
13.MAGNESIUM...P	[	1122]	E	
14.MANGANESE...P		91		
15.MERCURY....CV		0.1U		
16.NICKEL......P		10U		
17.POTASSIUM...P		354U		
18.SELENIUM....F		2.7U		R
19.SILVER......P		0.9U		
20.SODIUM......P		9U	E	
21.THALLIUM....F		5U		
22.TIN.........P		10U		
23.VANADIUM....P	[	11.1]		
24.ZINC........P		120	E	
25.CYANIDE.....C		N/R		
% SOLID		93		

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 026
DATE:6-6-86

INORGANIC ANALYSIS SHEET

0(5

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3986

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM
MATRIX: WATER: XX

ELEMENTS..METHOD		UG/L	
1. ALUMINIUM...P		1304	E
2. ANTIMONY....P		19 U	
3. ARSENIC.....F		10 U	
4. BARIUM......P	[	86]	E
5. BERYLLIUM...P	[	0.1]	
6. CADMIUM.....P		47.0	
7. CALCIUM.....P		53960	
8. CHROMIUM....P		65	E
9. COBALT......P	[	3]	
10.COPPER......P		89	E
11.IRON........P		8092	
12.LEAD........P		429	
13.MAGNESIUM...P		26090	
14.MANGANESE...P		517	
15.MERCURY....CV		.4U	
16.NICKEL......P		49	
17.POTASSIUM...P	[	1977]	
18.SELENIUM....F		5.0 U	R
19.SILVER......P	[	2.4]	
20.SODIUM......P		14660	
21.THALLIUM....F		10 U	
22.TIN.........P		19 U	
23.VANADIUM....P	[	7.3]	
24.ZINC........P		24200	
25.CYANIDE.....C		N/R	

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 027
DATE:6-6-86

0C 6

INORGANIC ANALYSIS SHEET

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3987

ELEMENTS IDENTIFIED AND MEASURED

CONC.: LOW: XX MEDIUM
MATRIX: WATER: XX

ELEMENTS..METHOD		UG/L		
1. ALUMINIUM...P		1467	E	
2. ANTIMONY....P		19 U		
3. ARSENIC.....F		10 U		
4. BARIUM......P	[	54]	E	
5. BERYLLIUM...P		0.1 U		
6. CADMIUM.....P		45.6		
7. CALCIUM.....P		186500		
8. CHROMIUM....P		29	E	
9. COBALT......P		2.6 U		
10.COPPER......P		114	E	
11.IRON........P		3299		
12.LEAD........P		666		
13.MAGNESIUM...P		53550		
14.MANGANESE...P		311		
15.MERCURY....CV		0.5		
16.NICKEL......P		18 U		
17.POTASSIUM...P	[	2621]		
18.SELENIUM....F		5.0 U		R
19.SILVER......P	[	2.2]		
20.SODIUM......P		53930		
21.THALLIUM....F		10 U		
22.TIN.........P		65		
23.VANADIUM....P	[	8.8]		
24.ZINC........P		68360		
25.CYANIDE.....C		N/R		

COMMENTS:

LAB MANAGER: JRB

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O. BOX 818 ALEXANDRIA,VA 22313
703/557-2490 FTS:8-557-2490

EPA SAMPLE NO:
MBG 028
DATE:6-6-86

00 7

INORGANIC ANALYSIS SHEET

LAB NAME: CALIF.ANAL.LAB. CASE NO:5945
SOW NO.: 784 QC RPT.#5945
LAB.SAMPLE NO.: P3988

ELEMENTS IDENTIFIED AND MEASURED

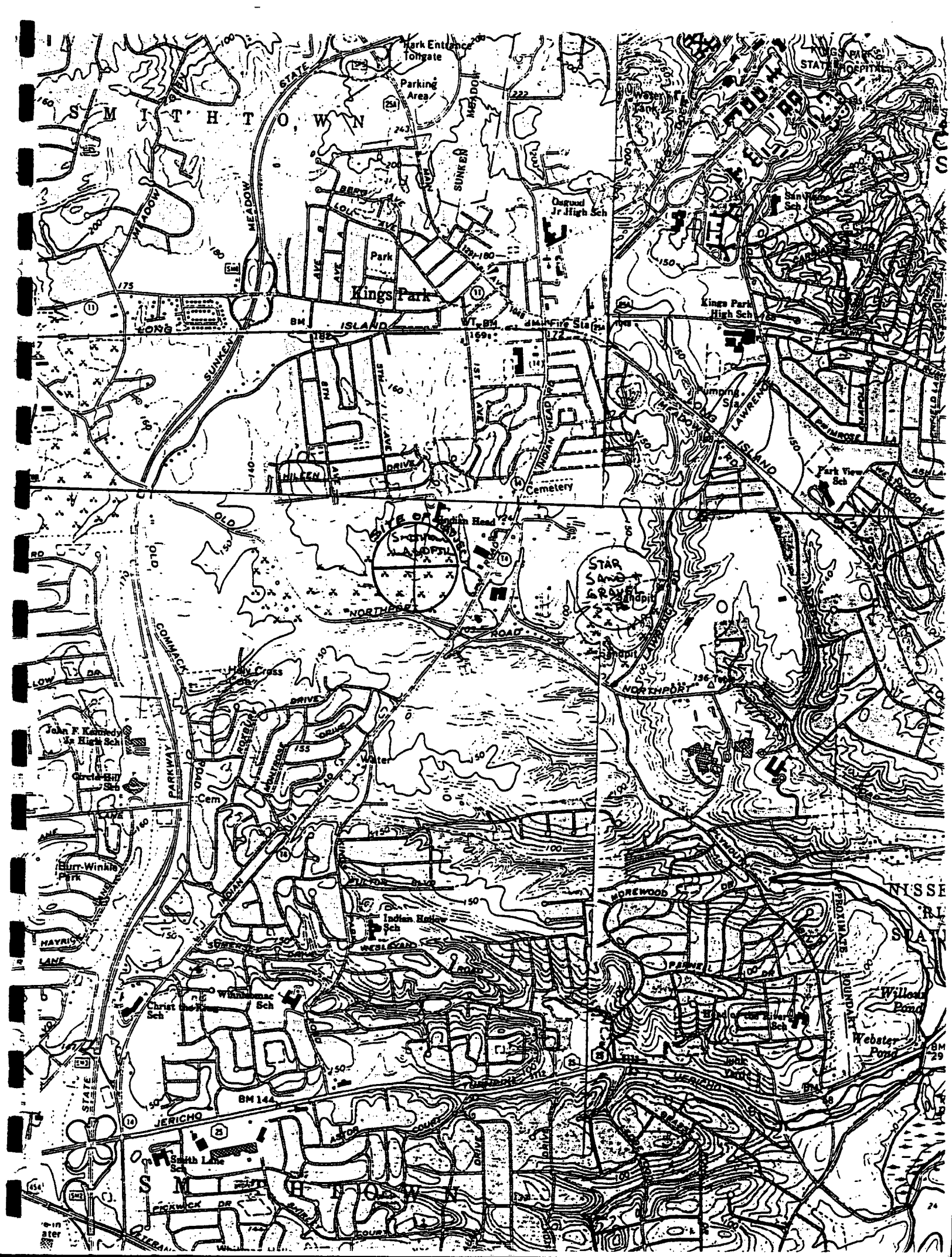
CONC.: LOW: XX MEDIUM
MATRIX: WATER: XX

ELEMENTS..METHOD		UG/L	
1. ALUMINIUM...P		15 U	E
2. ANTIMONY....P		19 U	
3. ARSENIC.....F		10 U	
4. BARIUM......P		0.6 U	E
5. BERYLLIUM...P		0.1 U	
6. CADMIUM.....P		3.0 U	
7. CALCIUM.....P	[	33]	
8. CHROMIUM....P	[	3]	E
9. COBALT......P		2.6 U	
10.COPPER......P		1.7 U	E
11.IRON........P		7.0 U	
12.LEAD........F		5.0 U	
13.MAGNESIUM...P		20 U	
14.MANGANESE...P	[	.4]	
15.MERCURY....CV		0.2 U	
16.NICKEL......P		18 U	
17.POTASSIUM...P	[	1377]	
18.SELENIUM....F		5.0 U	R
19.SILVER......P	[	4.3]	
20.SODIUM......P	[	29]	
21.THALLIUM....F		10 U	
22.TIN.........P		19 U	
23.VANADIUM....P	[	4.4]	
24.ZINC........P	[	13]	
25.CYANIDE.....C		N/R	

COMMENTS:

LAB MANAGER: JRB

REFERENCE NO. 18


SMITHTOWN
Kings Park
Park Entrance Tollgate
Parking Area
STATE
MEADOW
SUNKEN
MEADOW
LONG ISLAND
Oakwood Jr High Sch
Kings Park High Sch
Fire Sta
Pumping Sta
Cemetery
Indian Head
Site of Indian Village
Park View Sch
Holy Cross
John F. Kennedy Jr High Sch
Circle-Hill Sch
Burr-Winkle Park
Cem
Water
Indian Hollow Sch
Christ the King Sch
Wilshmamac Sch
Smith Lane Sch
BM 144
JERICHO
NORTHPORT
COMMACK
PARKWAY
Willow Pond
Webster Pond
STAR SAND & GRAVEL

TOWN OF SMITHTOWN

(516) 360-7553

CODE ENFORCEMENT BUREAU
JOHN VALENTINE
DIRECTOR

65 MAPLE AVENUE
SMITHTOWN, NEW YORK 11787

SUPERVISOR
PATRICK R. VECCHIO

TOWN COUNCIL
EUGENE A. CANNATARO
BRADLEY L. HARRIS
MICHAEL J. FITZPATRICK
JANE E. CONWAY

June 18, 1990

Mr. Eric Arnesen, Staff Hydrogeologist
Roux Associates, Inc.
The Huntington Atrium
775 Park Avenue
Suite 255
Huntington, New York 11743

Dear Mr. Arnesen:

As per your letter of June 1,.1990, please find attached the Fire Inspector Reports on both the Izzo Landfill and Star Sand and Gravel sites.

Fire Marshal Al Anderson has prepared these reports and if you have any further questions, please do not hesitate to contact him directly.

Very truly yours,

John Valentine
Bureau Director

JV:mdg
attachment
cc: Lieutenant Richard McKay
Fire Marshal Al Anderson
Investigator Bernie Kaplan

V90-0258

CONTINUATION REPORT
TOWN OF SMITHTOWN
CODE ENFORCEMENT BUREAU

65 Maple Avenue
Smithtown, New York 11787
(516) 360-7553

Case No. 90-4025

TYPE: ☐ Investigative
☐ Field
☐ Fire

g. Portable fire extinguishers not provided for all locations.

h. Flammable and/or combustible liquids leaking or being dumped on ground.

i. Warning: Signs not posted for flammable liquid dispensing area.

j. Unauthorized hold open open devices on flammable liquid pump nozzles.

k. Use of flammable and/or combustible tanks constructed for inground use, being used as above ground flammable and/or combustible liquid tanks.

l. Improper supports for flammable and/or combustible liquid tanks.

m. Lack of protection for flammable and/or combustible liquid tanks.

n. Lack of containment for flammable and/or combustible liquid tanks.

o. Flammable and/or combustible liquid tank and dispensing not grounded.

p. Warning signs not posted at location of flammable liquid storage.

q. Quantity and location of hazardous material not reported to Fire Chief and Code Enforcement Official annually.

r. Improper storage of oxidizing materials.

s. Compress gas cylinders not secured.

t. Compress gas cylinders not protected from vehicle traffic.

u. Protective caps missing from compress gas cylinders.

v. Oxygen and fuel gas cylinders not secured to fixed objects.

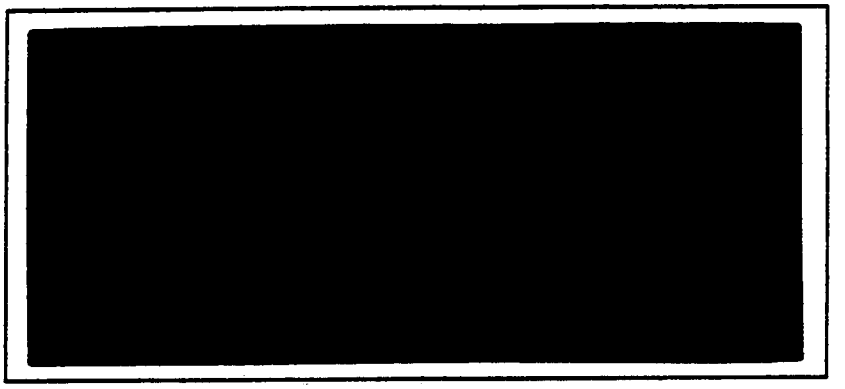
w. Storage structures not free from dry grass, vegitation and combustible waste.

Officer's Name

REFERENCE NO. 19

Zone 1 + 2

SP 1, 2, 3.



TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

box 1518 ▫ 60 seaview blvd., port washington, ny 11050 ▫ (516) 625-5500 ▫ fax (516) 625-1274

Project No.: 9521741
Log in No. : 23836
P.O. No. : Pending
Date : 05/31/95

ANALYTICAL DATA REPORT
PACKAGE FOR

Treatment Technology Corp.

64 Smithtown Blvd.

Smithtown, NY 11787

ATTN: Dr. Paul Orlowski
REF: Star Sand & Gravel, Proj. #1345-1

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE

SEE NEXT PAGE

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

REMO GIGANTE
EXEC. VICE PRESIDENT

NYS Lab ID. #10195
NJ Cert. #73469
dg

NYTEST ENVIRONMENTAL Inc.

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
2383601	SP1	Soil
2383602	SP3	Soil
2383603	SP2	Soil

Table of Contents

Log in No.: 23836

TURNAROUND TIME
Normal ✓
Rush _____
Date Needed: _____

Treatment Technology Corp.
64 Smithtown Blvd.
Smithtown, N.Y. 11787

CHAIN OF CUSTODY RECORD

LABORATORY NAME: NYTest
PROJECT NO. 1345-1
PROJECT NAME: Starr Sand & Gravel
PROJECT CONTACT:
RESULTS TO: Treatment Technology 516-979-5200
INVOICE TO: Treatment Technology

SAMPLE ID. NO.	DATE	TIME	No Containers Comp	No Containers Grab	SAMPLE LOCATION	ANALYSIS	REMARKS
SP1	5/11/95	2:95	1	✓	TP1		Total Metals & TPH & pH
SP2	5/11/95	3:00	1	✓	TP2		TCLP metals, TPH, Flash, PH, PCB, VOC
SP3	5/11/95	3:15	1	✓	TP3		Total metals & TPH & PH

Received from laboratory by: (Signature) Printed Name: \ Date: Time: Laboratory Name: NEI Reference Number:

Relinquished By: (Signature) Printed Name: JOHN NEVINS / John Nevins Date: 5/12/95 Time: 1335 Rec'd By (Signature): Date: 5/12/95 Time: 1335

Relinquished By: (Signature) Printed Name: Date: Time: Printed Name: PIERIDES P.

Sampler Signature: Paul Orlowski Sampler Printed Name: Dr. Paul Orlowski 5/11/95

Date Sampled: 5/11/95

Shipped Via: Hand delivered TTC

Special Instructions: Please FAX Results to 516-360-8835 Treatment Technology Attn: Dr. Paul Orlowski

100001

Laboratory Deliverable Check List

		Check if Complete
I.	Cover Page, Format, and Laboratory Certification (Include Cross Reference Table of Field I.D. # and Laboratory I.D. #)	✓
II.	Chain of Custody	✓
III.	Summary Sheets Listing Analytical Results Including QA Data Information	NA
IV.	Laboratory Chronicle and Methodology Summary including Sampling Holding Time Check	✓
V.	Initial Calibration and Continuing Calibration (Time & Date Summary)	✓
VI.	Tune Summary (MS)	✓
VII.	Blanks (Method, Field, Trip)	✓
VIII.	Surrogate Recovery Summary	✓
IX.	Chromatographs Labeled / Compound Identification	✓
X.	Non-Conformance Summary	✓

Laboratory Manager

5/31/95
Date

Laboratory Chronicle

Log In No.: 23836

Client Name: Treatment Technology Corp.
Date Received: 05/12/95
Sample ID: As per chain of custody

Organics Extraction:

1. Pesticides/PCBs 05/22/95

Analysis:

1. Volatiles 05/15/95
2. Pesticides/PCBs 05/23/95

Section Supervisor
Review & Approval

Inorganics:

1. Metals Digestion - 05/15/95, 05/23/95
   Analysis - 05/17/95, 05/25/95
2. Mercury Digestion & Analysis - 05/16/95

Other Analysis:

pH - 05/18/95 Flash Point - 05/23/95
TPHC - 05/26/95 TCLP Extraction - 05/15/95

Section Supervisor
Review & Approval

Quality Control Supervisor
Review & Approval

Dates include reextractions and reanalyses

NARRATIVE DISCUSSION
VOLATILES - 23836

INTRODUCTION

This narrative covers the analysis of one (1) sample in accordance with protocols based on SW-846 Method 8240.

HOLDING TIMES

The analytical holding time for this analysis was met.

CALIBRATIONS

All required minimum RRFs and maximum %RSD initial calibration requirements have been met in accordance with the method.

All required minimum RRFs and maximum %D continuing calibration requirements have been met in accordance with the method.

METHOD BLANKS

The method blank associated with this sample met all method requirements.

SURROGATES

All surrogate recoveries met QC criteria.

MATRIX SPIKES

Matrix Spikes were not designated to be performed on the sample covered by this report. Batched QC is being supplied. Please note that non site specific QC may demonstrate differing matrix affects than the sample contained in this login. The applicable Form 3 is, therefore, being supplied.

INTERNAL STANDARDS

Although internal standard area response/retention time summaries are not required, all samples yielded area responses and retention times which fell within an acceptable range.

SAMPLE COMMENTS

No analytical problems were encountered.

NARRATIVE DISCUSSION
PCB DATA - 23836

Surrogates

All recoveries met QC criteria.

Matrix Spike / Matrix Spike Duplicate (MS/MSD)

Batched QC is being supplied. Note that non site specific QC may demonstrate differing matrix affects than samples contained in this login. The applicable Form III is, therefore, being supplied.

Method Blanks

No target compounds were detected in PBLK61.

Calibrations

The initial and continuing calibrations passed QC criteria.

Samples

All samples were analyzed as per SW-846 Method 8080. No analytical problems were encountered.

c:\wp51\cns\ac

METHODOLOGY SUMMARY:

AQUEOUS METHODOLOGIES:	REF 1	REF 2	REF 3	REF 5
BNA, Pesticides/PCB's Extraction		3510/3520		
AA/ICP Sample Preparation	200.7			
Furnace Sample Preparation	200.0			
Mercury Sample Preparation	245.1			
Hexavalent Chromium Sample Preparation	218.5			
Clean-Up		3610/3620/3630/ 3640/3660		
Organochlorine Pesticide and PCB's by Gas Chromatography			608	505
Herbicides by Gas Chromatography			362	515.1
Purgeable Organics by GC/MS			624	524.2
Base/Neutral, Acids by GC/MS			625	525
2,3,7,8-TCDD by GC/MS			613/625	
BTEX			602	502.2
EDB/DBCP by Microextraction				504.1

NON-AQUEOUS METHODOLOGIES:	
BNA, Pesticides/PCB's Extraction	3550
AA/ICP Sample Preparation	3050
Furnace Sample Preparation	3020/3030/3050
Mercury Sample Preparation	7471
Clean-Up	3610/3620/3630/ 3640/3660

GC, Gas Chromatography/Mass Spectrometry:	
Purgeable Organics	8240/8021
Base/Neutral and Acid Extractables	8270
Organophosphorus Pesticides	8140
Organochlorine Pesticide and PCB's by Gas Chromatography	8080
BTEX	8020
Halogenated Purgeable Organics	8010

METHODOLOGY SUMMARY

INDUCTIVELY COUPLED PLASMA (ICP):	REFERENCE 1	REFERENCE 2
Aluminum	200.7	6010
Antimony	200.7	6010
Barium	200.7	6010
Beryllium	200.7	6010
Cadmium	200.7	6010
Calcium	200.7	6010
Chromium	200.7	6010
Cobalt	200.7	6010
Copper	200.7	6010
Iron	200.7	6010
Lead	200.7	6010
Magnesium	200.7	6010
Manganese	200.7	6010
Molybdenum	200.7	6010
Nickel	200.7	6010
Potassium	200.7	6010
Silver	200.7	6010
Sodium	200.7	6010
Tin	200.7	6010
Titanium	200.7	6010
Vanadium	200.7	6010
Zinc	200.7	6010
FURNACE AA:		
Antimony	204.1	7041
Arsenic	206.2	7060
Lead	239.2	7421
Selenium	270.2	7740
Thallium	279.2	7841
Tin	282.2	
Vanadium	286.2	7911
Mercury	245.1	7470/7471
ICAP:		
Priority Pollutants	200.7	6010/7060/ 7470/7740
TAL Metals	200.7	6010/7060/ 7470/7740
RCRA Metals	200.7	6010/7060/ 7470/7740

METHODOLOGY SUMMARY

ADDITIONAL INORGANIC PARAMETERS:	REFERENCE 1	REFERENCE 2
Biochemical Oxygen Demand	405.1	
Bromide	320.1	
Color	110.2	
Conductance	120.1	
Conductance		9050
Odor	140.1	
pH	150.1	
pH		9045/9040/9041
TDS	160.1	
TSS	160.2	
TS	160.3	
Hardness	130.1	
Temperature	170.1	
Turbidity	180.1	
Acidity	305.1	
Alkalinity	310.1	
Ammonia	350.2/350.3	
Chloride	325.3	
Chloride		9252
Residual Chlorine	330.2	
COD	410.3/410.4	
Cyanide (Total & Amenable)	335.3/335.1	9010/9012
Oil & Grease	413.1/413.2	
Oil & Grease		9070/9071
Fluoride	340.2	
TKN	351.2	
NO2/NO3	353.2	9200
D.O	360.2	
Petroleum Hydrocarbons (Reference 4)	418.1	9066
Phenol	420.2	
Phosphorus	365.1	
Settleable Solids	160.5	
Silica	370.1	
Sulfate	375.2/375.4	9038
Sulfide	376.1	9030
Surfactants	425.1	
TOC	415.1	9060
TOX		9020

MISCELLANEOUS ANALYSIS:		
Extraction Procedure Toxicity		1310
Ignitability		1010
Corrosivity		1110
Reactivity		Chapter 8.3
Paint Filter Liquid Test		9095
Toxicity Characteristic Leaching Procedure (TCLP)		(REF 4)
Cation Exchange Capacity of Soils		9080

METHODOLOGY SUMMARY

	REFERENCE 6
Total Coliform	909A
Fecal Coliform	9096
Fecal Streptococcus Coliform	910B
Standard Plate Count	907
Hexavalent Chromium	312B
Carbonaceous BOD	507

METHODOLOGY SUMMARY

REFERENCES:

(1) USEPA-600/4-79-020, Methods for Chemical Analysis of Water and Waste

(2) USEPA SW 846, Test Methods for Evaluating Solid Waste, Third Edition

(3) Federal Register 40 CFR Part 136, Vol.49, No.209 Test Parameters for the Analysis of Pollutants

(4) Federal Register Vol.51, No.216 Friday, 11/7/86, pp.40643-40652

(5) Method for the Determination of Organic Compounds in Drinking Water, EPA 500/4-88/039, Dec. 1988

(6) Standard Method for Examination of Water and Wastewater, 15 Edition 1980

Method Qualifiers for Organic Non-CLP Methodologies

Q Qualifier - Specified entries and their meanings as follows:

U - Indicates compound was analyzed for but was not detected. The sample quantitation limit is corrected for dilutions and for the moisture content for soil samples. If a sample extract can not be concentrated to the protocol - specific volume, this fact is also accounted for in reporting the sample quantitation limit. The number is the minimum detected limits for the sample.

J - Indicates an estimated volume. The flag is used either when estimating concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.

N - Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

B - This flag is used when the analyte is found in the analyte is found in the associated blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound.

E - This flag identifies compounds whose concentrations exceeded the calibration range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

A - This flag indicates that a TIC is a suspected aldol condensation product.

Volatile Data

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SP2

Lab Name: NYTEST ENV INC Contract: 9521741

Lab Code: NYTEST Case No.: 23836 SAS No.: SDG No.: 23836

Matrix: (soil/water) SOIL Lab Sample ID: 2383603

Sample wt/vol: 5.0 (g/mL) G Lab File ID: P4928.D

Level: (low/med) LOW Date Received: 05/12/95

% Moisture: not dec. 4 Data Analyzed: 05/15/95

Column: (pack/cap) CAP Dilution Factor: 1.0

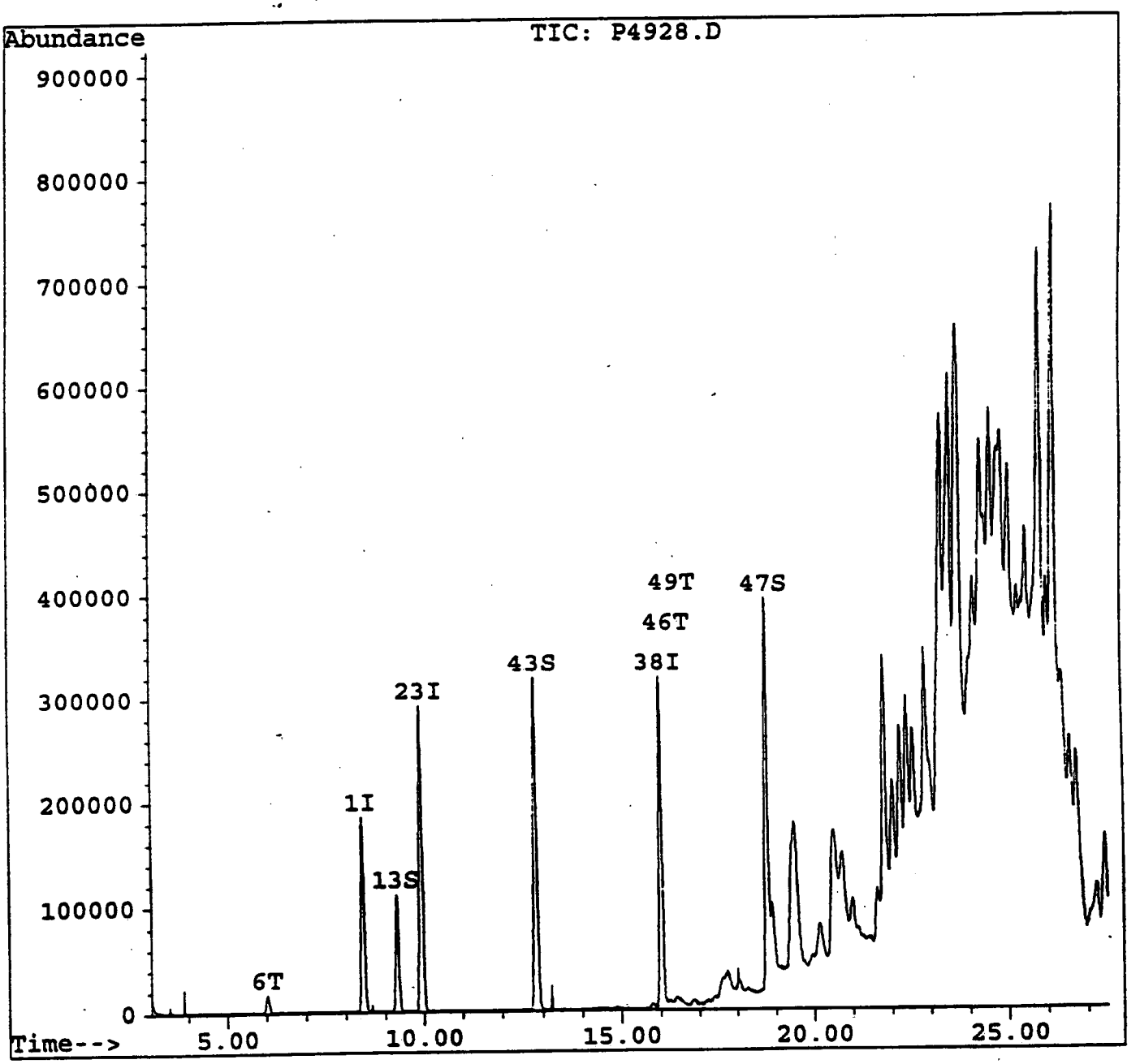
CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	6	J
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	1	J
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	4	J
108-05-4	Vinyl Acetate	10	U

Quantitation Report

Data File : c:\hpchem\1\data\0515\p4928.d
Acq On : 15 May 95 15:28 pm
Sample : 2383603,SP2,
Misc : 1,,4,,5,5,L,S,R5-12-95,
Quant Time: May 15 16:05 1995

Vial: 7
Operator: SC
Inst : HPP
Multiplr: 1.00

Method : c:\HPCHEM\1\METHODS\SOIL0511.M
Title : VOA Standards for 5 point calibration
Last Update : Tue May 16 09:58:14 1995
Response via : Single Level Calibration



000014

Quantitation Report

Data File : c:\hpchem\1\data\0515\p4928.d
Acq On : 15 May 95 15:28 pm
Sample : 2383603,SP2,
Misc : 1,,4,,5,5,L,S,R5-12-95,
Quant Time: May 15 16:05 1995

Vial: 7
Operator: SC
Inst : HPP
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SOIL0511.M
Title : VOA Standards for 5 point calibration
Last Update : Mon May 15 13:58:50 1995
Response via : Continuing Cal File: C:\HPCHEM\1\DATA\0515\P4918.D

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) CI01 Bromochloromethane	8.42	128	153075	50.00	ug/l	-0.02
23) CI10 1,4-Difluorobenzene	9.93	114	787045	50.00	ug/l	0.00
38) CI20 Chlorobenzene-d5	16.02	117	602808	50.00	ug/l	0.00
System Monitoring Compounds						%Recovery
13) CS15 1,2-Dichloroethane-d4	9.30	65	208616	50.55	ug/l	101.10%
43) CS05 Toluene-d8	12.83	98	735492	50.41	ug/l	100.82%
47) CS10 4-Bromofluorobenzene	18.78	95	470038	48.27	ug/l	96.54%
Target Compounds						Qvalue
6) C030 Methylene Chloride	6.02	84	25793	5.94	ug/l	88
46) C240 Ethylbenzene	16.24	106	6147	1.11	ug/l m	22
49) C250 M-P, Xylene	16.40	106	21519	3.38	ug/l m	69

000015

(#) = qualifier out of range (m) = manual integration

EPA SAMPLE NO.

VBLKP61

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: NYTEST ENV INC Contract: [illegible]

Lab Code: NYTEST Case No.: 23836 SAS No.: SDG No.: 23836

Matrix: (soil/water) SOIL Lab Sample ID: VBLKP61

Sample wt/vol: 5.0 (g/mL) G Lab File ID: P4919.D

Level: (low/med) LOW Date Received: 00/00/00

% Moisture: not dec. 0 Data Analyzed: 05/15/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U
108-05-4	Vinyl Acetate	10	U

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: NYTEST ENV INC Contract: 9521741

Lab Code: NYTEST Case No.: 23836 SAS No.: SDG No.: 23836

Level: (low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
01	VBLKP61	101	100	97		0
02	SP2	101	96	101		0
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

	QC LIMITS
SMC1 (TOL) = Toluene-d8	(81-117)
SMC2 (BFB) = Bromofluorobenzene	(74-121)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\SOIL0511.M
Title : VOA Standards for 5 point calibration
Last Update : Sun May 14 22:34:08 1995
Response via : Continuing Calibration

Non-Spiked Sample: P4847.D

	Spike Sample	Spike Duplicate Sample
File ID :	P4848.D	P4849.D
Sample :	2379804,TEC4MS,	2379805,TEC4MSD,
Acq Time:	11 May 95 22:23 pm	11 May 95 22:56 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
C045 1,1-Dichloroeth	0.0	50	49	39	97	77	23#	14	61-145
C150 Trichloroethene	0.0	50	53	43	106	87	20#	14	71-170
C165 Benzene	4.5	50	66	56	122	102	18#	11	76-127
C230 Toluene	38.1	50	116	96	157#	116	30#	13	76-125
C235 Chlorobenzene	1.0	50	72	60	142#	119	18#	13	75-130

SOIL0511.M Mon May 15 09:12:41 1995 HPPC Rod 5-5-95

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: NYTEST ENV INC Contract: 9521741

Lab Code: NYTEST Case No.: 23836 SAS No : SDG No.: 23836

Lab File ID: P4830.D BFB Injection Date: 05/11/95

Instrument ID: HPP BFB Injection Time: 1245

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	37.8
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	97.1
175	5.0 - 9.0% of mass 174	6.9 (7.1)1
176	Greater than 95.0%, but less than 101.0% of mass 174	94.7 (97.6)1
177	5.0 - 9.0% of mass 176	6.3 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD010P0	VSTD010P0	P4831.D	05/11/95	1315
02	VSTD020P0	VSTD020P0	P4832.D	05/11/95	1347
03	VSTD050P0	VSTD050P0	P4833.D	05/11/95	1416
04	VSTD100P0	VSTD100P0	P4834.D	05/11/95	1444
05	VSTD200P0	VSTD200P0	P4835.D	05/11/95	1513
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: NYTEST ENV INC Contract: 9521741

Lab Code: NYTEST Case No.: 23836 SAS No.: SDG No.: 23836

Lab File ID: P4917.D BFB Injection Date: 05/15/95

Instrument ID: HPP BFB Injection Time: 0928

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.1
75	30.0 - 60.0% of mass 95	39.4
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	72.2
175	5.0 - 9.0% of mass 174	5.1 (7.1)1
176	Greater than 95.0%, but less than 101.0% of mass 174	71.2 (98.6)1
177	5.0 - 9.0% of mass 176	4.8 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050P5	VSTD050P5	P4918.D	05/15/95	0939
02	VBLKP61	VBLKP61	P4919.D	05/15/95	1033
03	SP2	2383603	P4928.D	05/15/95	1528
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

GC DATA

8080PCB - FORM 1

NYTEST ENVIRONMENTAL INC.

TCL PCB ORGANICS ANALYSIS DATA SHEET

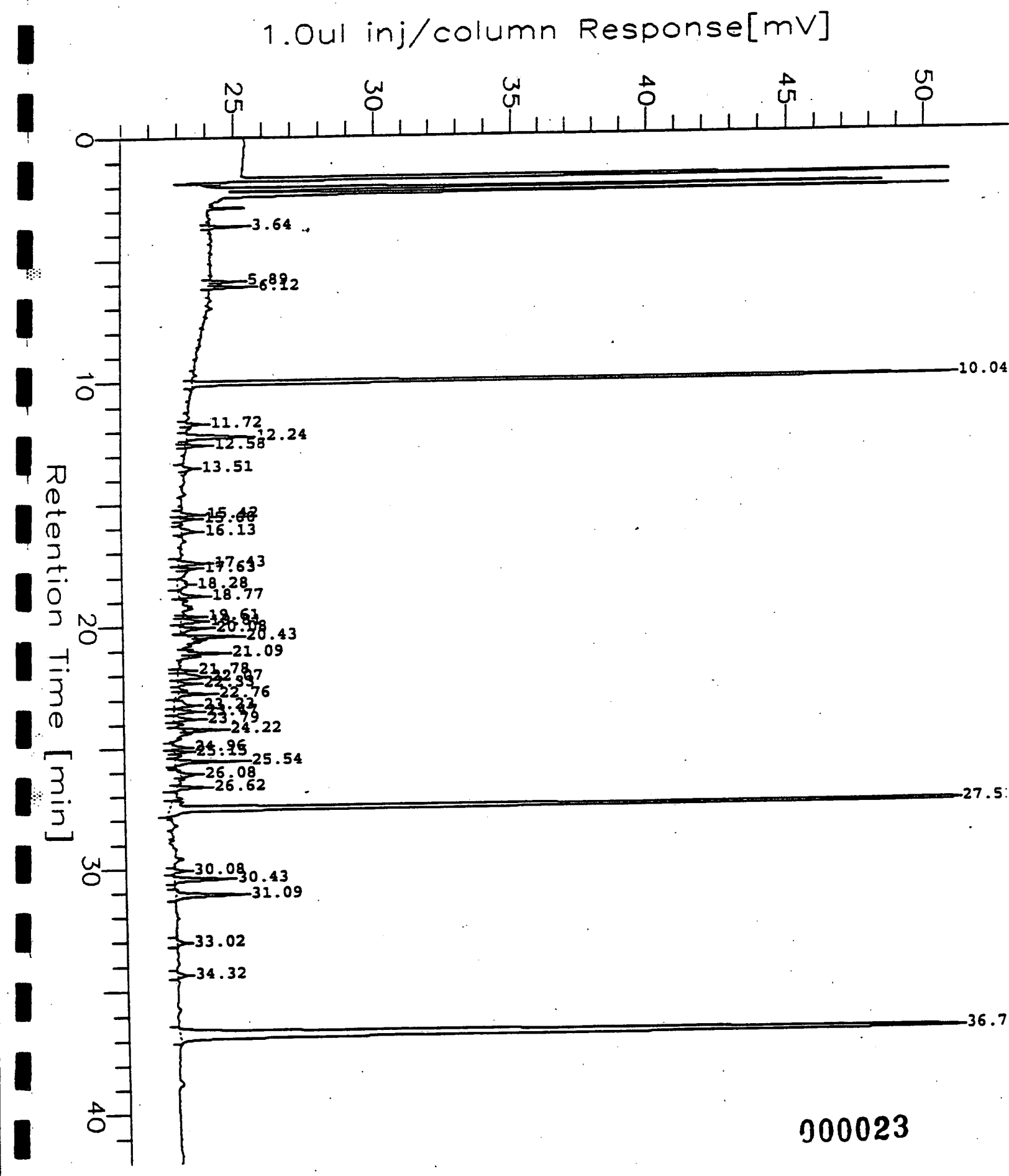
SAMPLE MATRIX:	SOIL	SAMPLE ID:	SP2
CONC. LEVEL:	LOW	LAB SAMPLE ID:	2383603
EXTRACTION DATE:	05/22/95	DIL FACTOR:	1.00
ANALYSIS DATE:	05/23/95	% MOISTURE:	4

CMPD #	CAS Number	PCB COMPOUND	UG/KG (DRY BASIS)
1	12674-11-2	Aroclor-1016	83 U
2	11104-28-2	Aroclor-1221	83 U
3	11141-16-5	Aroclor-1232	83 U
4	53469-21-9	Aroclor-1242	83 U
5	12672-29-6	Aroclor-1248	83 U
6	11097-69-1	Aroclor-1254	83 U
7	11096-82-5	Aroclor-1260	83 U

HP3A DB-608 0.53mm

Sample Name : 2383603
FileName : c:\2700\data2\343A005.raw
Method : HP3 ins
Start Time : 0.00 min End Time : 42.00 min
Scale Factor: 1 Plot Offset: 21 mV

Sample #: SP2
Date : 5/26/95 07:31
Time of Injection: 5/23/95 15:43
Low Point : 20.96 mV High Point : 50.96 mV
Plot Scale: 30 mV



000023

Software Version: 3.2 <16C20>
Sample Name : 2383603 Time : 5/26/95 07:30
Sample Number: SP2 Study :
Operator :

Instrument : 970-2:HP3_(HP5890-2) Channel : A A/D mV Range : 1000
AutoSampler : NONE
Rack/Vial : 0/0

Interface Serial # : 9221571285 Data Acquisition Time: 5/23/95 15:43
Delay Time : 0.00 min.
End Time : 42.00 min.
Sampling Rate : 2.5000 pts/sec

Raw Data File : c:\2700\data2\343A005.raw
Result File : c:\2700\data2\343A005.rst
Instrument File: c:\2700\HP3.ins
Process File : c:\2700\data\301.prc
Sample File : c:\2700\data2\342A-601.smp
Sequence File : c:\2700\data2\343.seq

Inj. Volume : 1 ul Area Reject : 5000.00
Sample Amount : 30.0000 Dilution Factor : 1.00

PEST-PCB REPORT DB-608

HP3A DB-608 30M X 0.53 MM ID 150 C, 275 C

Peak #	Ret Time [min]	Area [uV-sec]	Height [uV]	BL	Area/MG CAL FACT.	Amount ng/ul	Amount ppb(Wet)	Amount (ppb Dry)	Component Name	Comments NC/CON/<DL
3	6.12	5336	1255	BB	1000000	0.0053	0.000	X MULT FACTOR (666.6)		
4	10.04	215785	47083	BB	5903861	0.0366	0.037		TCX 73%	
6	12.24	15540	2128	BB	1000000	0.0155	0.000			
12	17.43	7078	951	BB	124790	0.0567	0.057		AROCLOR-1016-5	
14	18.28	6793	380	BB	1000000	0.0068	0.000			
15	18.77	5908	828	BB	1000000	0.0059	0.000			
17	19.81	5509	719	VB	1000000	0.0055	0.000			
18	20.08	6043	957	BB	1000000	0.0060	0.000			
19	20.43	7442	1547	BB	1000000	0.0074	0.000			
20	21.09	6024	1205	BB	1000000	0.0060	0.000			
22	22.07	9700	868	VB	1000000	0.0097	0.000			
24	22.76	7096	1130	BB	169285	0.0419	0.042		AROCLOR-1260	
25	23.23	7814	715	BV	1000000	0.0078	0.000			
26	23.47	6299	824	VV	296885	0.0212	0.021		AROCLOR-1260-2	<DL
27	23.79	6359	883	VB	305712	0.0208	0.021		AROCLOR-1260-3	<DL
28	24.22	7563	1364	BB	1000000	0.0076	0.000			
31	25.54	14401	2408	BB	257070	0.0560	0.056		AROCLOR-1260-5	<DL
33	26.62	6374	1031	BB	1000000	0.0064	0.000			
34	27.51	314751	54938	BB	4227264	0.0745	0.075		DIBUTYLCHLORENDATE 74%	
36	30.43	14580	1923	BB	1000000	0.0146	0.000			
37	31.09	19254	2330	BB	1000000	0.0193	0.000			
40	36.73	357439	32025	BB	5882913	0.0608	0.061		DCB 122%	
		1053086	157491			0.4923	0.368			

NC=NOT CONFIRMED; CON=CONFIRMED; PREPARED BY... REVIEWED BY...

Patricia Cannon
5-26-95

000024

8080PCB - FORM 1

NYTEST ENVIRONMENTAL INC.

TCL PCB ORGANICS ANALYSIS DATA SHEET

SAMPLE MATRIX:	SOIL	SAMPLE ID:	PBLK61
CONC. LEVEL:	LOW	LAB SAMPLE ID:	PSB0522B
EXTRACTION DATE:	05/22/95	DIL FACTOR:	1.00
ANALYSIS DATE:	05/23/95	% MOISTURE:	NA

CMPD #	CAS Number	PCB COMPOUND	UG/KG (DRY BASIS)
1	12674-11-2	Aroclor-1016	80 U
2	11104-28-2	Aroclor-1221	80 U
3	11141-16-5	Aroclor-1232	80 U
4	53469-21-9	Aroclor-1242	80 U
5	12672-29-6	Aroclor-1248	80 U
6	11097-69-1	Aroclor-1254	80 U
7	11096-82-5	Aroclor-1260	80 U

2 D

NYTEST ENVIRONMENTAL INC.

PCB SURROGATE RECOVERY

LOGIN # : 23836

MATRIX : SOIL

		<<<<<<<<<<<< PCB >>>>>>>>>>>>			
	SAMPLE ID	TCX % RECOVERY	DBC % RECOVERY	DCB % RECOVERY	SURR. OUT
01	SP2	73 OK	74 OK	122 OK	0
02	PBLK61	63 OK	48 OK	119 OK	0
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					

	LIMITS
Tetrachloroxylene (TCX)	60 - 150
Dibutylchlorendate (DBC)	20 - 150
Decachlorobiphenyl (DCB)	60 - 150

* RECOVERY OUTSIDE ADVISORY QC LIMITS

I MATRIX INTERFERENCE

PCB - FORM 3

NYTEST ENVIRONMENTAL INC.

PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

LOGIN # : 23836

MATRIX: SOIL

	COMPOUND	CONC SPIKE ADDED (ppb)	SAMPLE RESULT	CONC MS	% RECOVERY	CONC MSD	% RECOVERY	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
SAMPLE ID	PCB 1016	347	0	378	109 OK	335	97 OK	12 OK	23	10 - 230
NYTEST ID 2387408	PCB 1260	347	11358	15190	1105 *	14427	885 *	22 OK	28	10 - 195

OF PCB % REC OUTSIDE 2 OF 4
ADVISORY QC LIMITS: ___

OF PCB RPD VALUES OUTSIDE 0 OF 2
ADVISORY QC LIMITS: ___

METALS DATA

NYTEST ENVIRONMENTAL INC.

INORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SP1

Lab Name: NYTEST_ENV_INC. Contract: 9521741

Lab Code: NYTEST Login No.: 23836 QC Report No.23836

Matrix (soil/water): SOIL
Level (low/high) : LOW
Percent Solids : 94.0

TOTALS

Lab Sample ID: 383601
Date Received: 05/12/95

Concentration Units (ug/L or mg/kg dry weight): MG/KG ppm but %20

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6			F
7440-39-3	Barium	50.6			P
7440-43-9	Cadmium	0.49	U		P
7440-47-3	Chromium	7.1			P
7439-92-1	Lead	58.6			P
7439-97-6	Mercury	0.11	U		CV
7782-49-2	Selenium	0.50	U		F
7440-22-4	Silver	0.69	U		P

CODES :
P: ICP; F : GFAA; CV: Cold Vapor; AS: Automated Spectrophotometric
Note: A "U" in the "C" (Concentration) column indicates the analyte was not detected in this sample; "B" = Sample value greater than Instrument Detection Limit, but less than reporting limit; "NR" = Not Required.

Comments:
SP1

NYTEST ENVIRONMENTAL INC.

INORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SP3

Lab Name: NYTEST_ENV_INC._____ Contract: 9521741___

Lab Code: NYTEST Login No.: 23836_ QC Report No.23836_

Matrix (soil/water): SOIL_ Lab Sample ID: 383602____
Level (low/high) : LOW Date Received: 05/12/95
Percent Solids : _97.0

TOTALS

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.64	B		F
7440-39-3	Barium	17.3	B		P
7440-43-9	Cadmium	0.45	U		P
7440-47-3	Chromium	4.2			P
7439-92-1	Lead	8.8			P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	0.47	U		F
7440-22-4	Silver	0.63	U		P

CODES :
P: ICP; F : GFAA; CV: Cold Vapor; AS: Automated Spectrophotometric
Note: A "U" in the "C" (Concentration) column indicates the analyte was not detected in this sample; "B" = Sample value greater than Instrument Detection Limit, but less than reporting limit; "NR" = Not Required.

Comments:
SP3

000030

NYTEST ENVIRONMENTAL INC.

INORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

SP2

Lab Name: NYTEST_ENV_INC. Contract: 9521741

Lab Code: NYTEST Login No.: 23836

QC Report No.23836

Matrix (soil/water): WATER
Level (low/high) : LOW
Percent Solids : 0.0

Lab Sample ID: T383603
Date Received: 05/12/95

Concentration Units (ug/L or mg/kg dry weight): MG/L ppm

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.056000	U		P
7440-39-3	Barium	0.124690	B		P
7440-43-9	Cadmium	0.005000	U		P
7440-47-3	Chromium	0.008000	U		P
7439-92-1	Lead	0.046000	U		P
7439-97-6	Mercury	0.000200	U		CV
7782-49-2	Selenium	0.087000	U		P
7440-22-4	Silver	0.007000	U		P

CODES :
P: ICP; F : GFAA; CV: Cold Vapor; AS: Automated Spectrophotometric
Note: A "U" in the "C" (Concentration) column indicates the analyte was not detected in this sample; "B" = Sample value greater than Instrument Detection Limit, but less than reporting limit; "NR" = Not Required.

Comments:
SP2 TCLP

NYTEST ENVIRONMENTAL INC.

ANALYTICAL AND METHOD BLANK SUMMARY

Lab Name: NYTEST_ENV_INC._____ Contract: 9521741___

Lab Code: NYTEST Login No.: 23836_ QC Report No.: 23836__

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Arsenic											NR
Barium									1.700	U	P
Cadmium									0.500	U	P
Chromium									0.800	U	P
Lead									4.600	U	P
Mercury									0.100	U	CV
Selenium											NR
Silver									0.700	U	P

NR = Analyte Not Requested

NYTEST ENVIRONMENTAL INC.

ANALYTICAL AND METHOD BLANK SUMMARY

Lab Name: NYTEST_ENV_INC._____ Contract: 9521741___

Lab Code: NYTEST Login No.: 23836_ QC Report No.: 23836__

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Arsenic									-56.700		P
Barium									17.000	U	P
Cadmium									5.000	U	P
Chromium									8.000	U	P
Lead									46.000	U	P
Mercury									0.200	U	CV
Selenium									87.000	U	P
Silver									7.000	U	P

NR = Analyte Not Requested

NEI FORM 5 - (1/94)

NYTEST ENVIRONMENTAL INC.

ANALYTICAL AND METHOD BLANK SUMMARY

Lab Name: NYTEST_ENV_INC._____ Contract: 9521741___

Lab Code: NYTEST Login No.: 23836_ QC Report No.: 23836__

Preparation Blank Matrix (soil/water): SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Arsenic									0.500	U	F
Barium											NR
Cadmium											NR
Chromium											NR
Lead											NR
Mercury											NR
Selenium									0.500	U	F
Silver											NR

NR = Analyte Not Requested

NEI FORM 5 - (1/94)

GENERAL CHEMISTRY DATA

NYTEST ENVIRONMENTAL, INC

REPORT OF ANALYSIS

We find as follows : Log In No : 23836

Sample Identification

Lab ID :	2383601	2383602	2383603	Method
Client ID :	SP1	SP3	SP2	Blank
Parameter(s)				
pH	8.27	9.07	8.66	NA
Flash Point, Degrees F	NR	NR	NR	NA

U : Below method blank/method reporting limit
E : Above method limit
NA : Not available
NR : Not Required

NYTEST ENVIRONMENTAL, INC

REPORT OF ANALYSIS

We find as follows :

Log In No : 23836

Results in mg/Kg(dry basis) :

Sample Identification	CLIENT ID	Parameter(s) Total Petroleum Hydrocarbons
Soil Method Blank		10 U
Soil Method Detection Limit		10
LAB ID	CLIENT ID	
2383601	SP1	5.9
2383602	SP3	6.3
2383603	SP2	10 U

U: Below method blank / method reporting limit

REFERENCE NO. 20

TOTAL ANALYTICAL SERVICES FOR A SAFE ENVIRONMENT

nytest environmental inc.

Project No.: 9521741
Log in No. : 24122
P.O. No. : Pending
Date :

ANALYTICAL DATA REPORT
PACKAGE FOR

Treatment Technology Corp.

64 Smithtown Blvd.

Smithtown, NY 11787

ATTN: Dr. Paul Orlowski
REF: Star Sand & Gravel, Proj. #1345-1

LABORATORY NUMBER	SAMPLE IDENTIFICATION	TYPE OF SAMPLE
2412301	#1	Soil

WE CERTIFY THAT THIS REPORT IS A TRUE REPORT OF RESULTS OBTAINED FROM OUR TESTS OF THIS MATERIAL.

NYS Lab ID. #10195
NJ Cert. #73469

RESPECTFULLY SUBMITTED,
NYTEST ENVIRONMENTAL INC.

KENO GIGANTE
EXEC. VICE PRESIDENT

TURNAROUND TIME
Normal ✓
Rush _____
Date Needed: _____

Treatment Technology Corp.
64 Smithtown Blvd.
Smithtown, N.Y. 11787

CHAIN OF CUSTODY RECORD

LABORATORY NAME: NYTest Envir
RESULTS TO: Treatment Technology
INVOICE TO: Treatment Technology

PROJECT NO. 24122
PROJECT NAME: Star Sand & Gravel
PROJECT CONTACT: Dr. Paul Orlowski

SAMPLE ID. NO.	DATE	TIME	No Containers Comp	No Containers Grab	SAMPLE LOCATION	ANALYSIS: Total metals	ANALYSIS: TPH	ANALYSIS	ANALYSIS	REMARKS
Background	7/20/95			1	off site	8 met	1			Totals Metals / TPH

Received from Laboratory By (Signature) Printed Name: [signature] — Date: 7/21/95 — Time:
Relinquished By (Signature) Printed Name: [signature] — Date: — Time:
Relinquished By (Signature) Printed Name: — Date: — Time:

Laboratory Name: NYTest
Reference Number: 24122
Received By (Signature) — Date — Time
Printed Name: — Sampler Printed

Sampler Signature Name: [signature] + NYSDEC
Date Sampled: 7/20/95
Shipped Via: Hand deliver
Special Instructions:

09/07/95 10:25 FAX 516 330 8835 64 Smithtown Blvd 003

Laboratory Deliverable Check List

		Check if Complete
I.	Cover Page, Format, and Laboratory Certification (Include Cross Reference Table of Field I.D. # and Laboratory I.D. #)	✓
II.	Chain of Custody	✓
III.	Summary Sheets Listing Analytical Results Including QA Data Information	NA
IV.	Laboratory Chronicle and Methodology Summary including Sampling Holding Time Check	✓
V.	Initial Calibration and Continuing Calibration (Time & Date Summary)	NA
VI.	Tune Summary (MS)	NA
VII.	Blanks (Method, Field, Trip)	✓
VIII.	Surrogate Recovery Summary	NA
IX.	Chromatographs Labeled / Compound Identification	NA
X.	Non-Conformance Summary	✓

Laboratory Manager

Date

Laboratory Chronicle

Client Name: Treatment Technology Corp.
Date Received: 06/12/95
Sample ID: #137

Log In No.: 24

Organics Extraction:

1. Acids
2. Base/Neutrals
3. Pesticides/PCBs
4. Dioxin

Analysis:

1. Volatiles
2. Acids
3. Base. Neutrals
4. Pesticides/PCBs
5. Dioxin

Section Supervisor
Review & Approval

Inorganics:

Digestion - Analysis -

1. Metals
Mercury Digestion & Analysis - 06/16/95

2. Cyanides

Other Analysis:

TPHC Extraction & Analysis - 06/23/95

Section Supervisor
Review & Approval

Quality Control Supervisor
Review & Approval

If fractions are re-extracted and re-analyzed include dates for both.

NON-CONFORMANCE SUMMARY
(Case Narrative)

Log In No: 24122

Sample Background (2412201) was analyzed as per required protocols, no problems were encountered.

Comments: Background

METHODOLOGY SUMMARY

INDUCTIVELY COUPLED PLASMA (ICP):	REFERENCE 1	REFERENCE 2
Aluminum	200.7	6010
Antimony	200.7	6010
Barium	200.7	6010
Beryllium	200.7	6010
Cadmium	200.7	6010
Calcium	200.7	6010
Chromium	200.7	6010
Cobalt	200.7	6010
Copper	200.7	6010
Iron	200.7	6010
Lead	200.7	6010
Magnesium	200.7	6010
Manganese	200.7	6010
Molybdenum	200.7	6010
Nickel	200.7	6010
Potassium	200.7	6010
Silver	200.7	6010
Sodium	200.7	6010
Tin	200.7	6010
Titanium	200.7	6010
Vanadium	200.7	6010
Zinc	200.7	6010
FURNACE AA:		
Antimony	204.1	7041
Arsenic	206.2	7060
Lead	239.2	7421
Selenium	270.2	7740
Thallium	279.2	7841
Tin	282.2	
Vanadium	286.2	7911
Mercury	245.1	7470/7471
ICAP:		
Priority Pollutants	200.7	6010/7060/. 7470/7740
TAL Metals	200.7	6010/7060/ 7470/7740
RCRA Metals	200.7	6010/7060/ 7470/7740

METHODOLOGY SUMMARY

ADDITIONAL INORGANIC PARAMETERS:	REFERENCE 1	REFERENCE 2
Biochemical Oxygen Demand	405.1	
Bromide	320.1	
Color	110.2	
Conductance	120.1	
Conductance		9050
Odor	140.1	
pH	150.1	
pH		9045/9040/9041
TDS	160.1	
TSS	160.2	
TS	160.3	
Hardness	130.1	
Temperature	170.1	
Turbidity	180.1	
Acidity	305.1	
Alkalinity	310.1	
Ammonia	350.2/350.3	
Chloride	325.3	
Chloride		9252
Residual Chlorine	330.2	
COD	410.3/410.4	
Cyanide (Total & Amenable)	335.3/335.1	9010/9012
Oil & Grease	413.1/413.2	
Oil & Grease		9070/9071
Fluoride	340.2	
TKN	351.2	
NO2/NO3	353.2	9200
D.O	360.2	
Petroleum Hydrocarbons (Reference 4)	418.1	9066
Phenol	420.2	
Phosphorus	365.1	
Settleable Solids	160.5	
Silica	370.1	
Sulfate	375.2/375.4	9038
Sulfide	376.1	9030
Surfactants	425.1	
TOC	415.1	9060
TOX		9020

MISCELLANEOUS ANALYSIS:		
Extraction Procedure Toxicity		1310
Ignitability		1010
Corrosivity		1110
Reactivity		Chapter 8.3
Paint Filter Liquid Test		9095
Toxicity Characteristic Leaching Procedure (TCLP)		(REF 4)
Cation Exchange Capacity of Soils		9080

METHODOLOGY SUMMARY

EFERENCES:

1) USEPA-600/4-79-020, Methods for Chemical Analysis of Water and Waste

2) USEPA SW 846, Test Methods for Evaluating Solid Waste, Third Editio

3) Federal Register 40 CFR Part 136, Vol.49, No.209 Test Parameters for the Analysis of Pollutants

4) Federal Register Vol.51, No.216 Friday, 11/7/86, pp.40643-40652

5) Method for the Determination of Organic Compounds in Drinking Water, EPA 500/4-88/039, Dec. 1988

6) Standard Method for Examination of Water and Wastewater, 15 Edition 1980

FORM I-IN includes fields for three types of results qualifiers. These qualifiers must be completed as follows:

* C (Concentration) qualifier – Enter "B" if the reported value was obtained from a reading that was less than Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

* Q Qualifier – Specified entries and their meanings are as follows:

E - The reported value is estimated because of the presence of interference.

M - Duplicate precision not met (CV > 20%).

N - Spiked sample recovery not within control limits.

S - The reported value was determined by Method of Standard Addition (MSA).

W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

* - Duplicate analysis not within control limits.

+ - Correlation Coefficient for MSA is less than 0.995.

Entering "S", "W" or "+" is mutually exclusive.

* M (Method) qualifier - enter:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "CV" for Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- "NR" if the analyte is not required to be analyzed.

NYTEST ENVIRONMENTAL, INC.
REPORT OF ANALYSIS

We find as follows:

Log In

Parame

Sample Identification	Total Petrole
Soil Method Blank	1
Soil Method Detection Limit	1

LAB ID	CLIENT ID	
2412201	Background	6

U: Below method blank / method reporting limit

Comments: Background

U.S. EPA - CLP
1

EPA SAMPLE NO.
#Background

INORGANIC ANALYSES DATA DATA SHEET

Lab Name: NYTEST_ENV_INC_____ Contract: 9521741

Lab Code: NYTEST Case No.: 24122_ SAS No.: ___ SDG No.: 24122

Matrix (Soil/water): SOIL Lab Sample ID: 412201

Level (low/Med): LOW__ Date Received: 07/20/95

% Solids: 86.0

TOTALS.

Concentrations Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.2			P
7440-39-3	Barium	26.4			P
7440-43-9	Cadmium	0.03			P
7440-47-3	Chromium	2.8			P
7439-92-1	Lead	40.1		2	P
7439-97-6	Mercury	0.11			CV
7782-49-2	Selenium	0.61			P
7440-22-4	Silver	0.04	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After : _____ Clarity After: _____ Artifacts: _____

Comments: Background _____

REFERENCE NO. 21

CHEMICAL ELEMENT CONTENT OF NATURAL SOILS

Element	Common Range (ppm)	Average (ppm)	Element	Common Range (ppm)	Average (ppm)
Aluminum	10,000-300,000	71,000	Lead	2-200	10
Antimony	0.6-10	--	Lithium	5-200	20
Arsenic	0.1-40	5	Magnesium	600-6,000	5,000
Barium	100-3,500	430	Manganese	100-4,000	600
Beryllium	0.1-40	6	Mercury	0.01-0.8	.11
Boron	2-130	10	Molybdenum	0.2-5	2
Bromine	1-10	5	Nickel	5-1,000	40
Cadmium	0.01-7	.06	Radium	8×10^{-5}	--
Cerium	30-50	--	Rubidium	20-600	10
Cesium	0.3-25	6	Scandium	10-25	--
Chlorine	20-900	100	Selenium	0.1-2	.3
Chromium	5-3,000	100	Silver	0.01-5	.05
Cobalt	1-40	8	Strontium	50-1,000	200
Copper	2-100	30	Thorium	0.1-12	--
Fluorine	10-4,000	200	Tin	2-200	10
Gallium	0.4-300	30	Tungsten	--	1
Germanium	1-50	--	Uranium	0.9-9	1
Gold	--	1	Vanadium	20-500	100
Iodine	0.1-40	5	Yttrium	10-500	50
Lanthanum	1-5,000	30	Zinc	10-300	50
			Zirconium	60-2,000	300

REFERENCES:
- USEPA Office of Solid Waste and Emergency Response; HAZARDOUS WASTE LAND TREATMENT, SW-874 (April, 1983) Page 273, Table 6.46.
- USEPA Hazardous Waste Engineering Research Laboratory; RECLAMATION AND REDEVELOPMENT OF CONTAMINATED LAND, Volume I, EPA/600/2-86/066 (August, 1986) Pages 172 and 173, Table B-16.
- THE FATE OF HAZARDOUS MATERIAL IN SOIL; James Dragun, HAZARDOUS MATERIALS CONTROL, Vol. 1 No. 2 (March-April, 1988).

S AND METALS

ity In:
Non-Productive Soil

241733
241854
241951
241951
241951

241951
241951
241951
241968
241990

242003
242017
242042
242043
242044

242049
242051
242060
242062
242065

242065
242066
242066
242066
242067

242068
242069
242072

78), pp. 503-514.

el Phase III Report"

REFERENCE NO. 22

Appendix 1.3-1
1 of 10

Hydrogeology of the Huntington-Smithtown area Suffolk County, New York

By E. R. LUBKE

CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1669-D

Prepared in cooperation with the Suffolk County Board of Supervisors, the Suffolk County Water Authority, and the New York Water Resources Commission

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1964

TABLE 2.—*Summary of the stratigraphy and water-bearing properties of the deposits underlying the Huntington-Smithtown area, Suffolk County, N.Y.*

System	Series	Stratigraphic unit	Thickness (feet)	Character of deposits	Water-bearing properties
Quaternary	Recent	Recent deposits: Artificial fill, marsh deposits, beach deposits, and surficial soil.	0–20±	Sand, gravel, silt, and clay; organic mud, peat, loam, and shells. Colors are brown, yellow and gray.	Sandy and gravelly beach deposits may locally yield small supplies of fresh to brackish water to wells. Marine silt and clay in north-shore harbors retard salt-water encroachment and confine underlying aquifers.
	Pleistocene	Upper Pleistocene deposits.	0–300±	Till composed of unassorted clay, sand, and boulders as ground moraine in area north of Harbor Hill terminal moraine and possibly as buried ground moraine of the Ronkonkoma lobe. Outwash deposits of brown well-stratified sand and gravel—predominantly quartzose but containing biotite and other dark minerals and igneous and metamorphic rock fragments—including advance outwash, channel and valley-fill, and outwash-plain deposits. Ice-contact deposits of crudely stratified sand and gravel and isolated masses of till in the Ronkonkoma and Harbor Hill terminal moraines. Glaciolacustrine deposits of brown and gray silt and clay interstratified with outwash deposits in buried valleys.	Till, relatively impermeable; commonly causes perched-water bodies to form locally and impedes recharge from precipitation. Outwash and ice-contact deposits are moderately to highly permeable. Wells screened in outwash deposits generally at depths of less than 250 ft yield as much as 1,700 gpm. Specific capacities of public-supply wells range from 22 to 222 gpm per ft of drawdown. Water is generally fresh and unconfined. Chief source of water for domestic, public-supply, industrial, and irrigation wells in project area. Glaciolacustrine deposits of silt and clay are relatively impermeable and locally retard movement of water between adjacent water-bearing beds in Pleistocene and Cretaceous deposits.
		---Unconformity?---			
		Pleistocene deposits undifferentiated.	0–400±	Sand, gravel, clay, and silt. Lignite present in some silt or clay layers. Colors are brown and gray. These deposits are present in deep buried valleys and may include equivalents of the Gardiners clay and the Jameco gravel found elsewhere on Long Island. This unit may include some Pliocene(?) deposits, but evidence is scanty.	Coarse sand and gravel beds are permeable and would presumably yield moderate to large supplies to properly constructed wells. One well, S16,137, screened in these deposits yields 1,400 gpm, and has a specific capacity of 46 gpm per ft of drawdown. Silt and clay beds confine water in adjacent water-bearing beds.
Tertiary(?)	Pliocene(?)	---Unconformity?---			
		Mannetto gravel	0–300±	Stratified sand and gravel and scattered clay lenses; unit is predominantly quartzose; igneous and metamorphic rock fragments are scarce. Colors are pale to yellowish brown. Cape hills in western part of Huntington and locally present in buried valleys.	Deposits are moderately to highly permeable but generally lie above the zone of saturation. Locally, water supplies for domestic use are obtained from these deposits, such as at wells S4, S208 and S927. No large public-supply or industrial wells were screened in these deposits in 1960.
		---Unconformity---			
		Magothy(?) formation	0–800±	Sand, clayey, with silt, clay, and some gravel. Colors are white, gray, brown, yellow, and red. The upper part of the formation commonly includes interbedded clay, fine to medium sand, silt, and some lignite; the lower part is largely coarse sand, gravel, and some clay.	Generally ranges from moderately to highly permeable. The lower part of the formation is more permeable than the upper part. Several public-supply wells screened in the basal zone have yields ranging from 1,000 to 1,300 gpm and specific capacities from 30 to 90 gpm per ft of drawdown. Water is generally of excellent quality. Second most important source of water to wells. Unconfined conditions are common in uppermost part of formation, but confined conditions prevail in the lower part; some wells flow.
Cretaceous	Upper Cretaceous	---Unconformity---			
		Raritan formation: Clay member	0(?)–185±	Clay and silt, and a few layers of sand. Lignite and pyrite concretions are common. Colors are mostly gray, white, and red.	Relatively impermeable. Acts as a confining bed, which retards but does not prevent movement of water between the Magothy(?) formation and the Lloyd sand member.
		Raritan formation: Lloyd sand member	200–265±	Sand, fine to coarse, and gravel, mixed with some clay and some layers of silt and clay. Colors are white to pale yellow.	Moderately permeable. Not extensively developed. Several public-supply and industrial wells yield as much as 250 gpm in northern Huntington, but potential yields from properly constructed wells are much greater. Water is confined and some wells flow. Water is generally of excellent quality, but on Eaton Neck it is brackish.
		---Unconformity---			
Precambrian to lower Paleozoic		Bedrock		Crystalline metamorphic and igneous rocks.	Relatively impermeable. Forms the floor of the groundwater reservoir.

The lower part of the Magothy(?) formation becomes increasingly coarser textured at depth, as indicated by the greater frequency of gravelly layers. Several wells, which have penetrated the basal zone of the Magothy(?), have penetrated thick layers of gravel intercalated with layers of finer grained sediments (pl. 4). This gravelly zone, which appears to be present through most of the project area, rests directly on the clay member of the Raritan. It crops out in bluffs along the northwest coast of Lloyd Neck (pl. 2). The upper limit of the gravelly zone is poorly defined but is presumably gradational into finer grained sediments characteristic of the upper part of the Magothy(?). The maximum thickness of this zone is about 200 feet.

Most of the wells in the project area that penetrate Cretaceous deposits are screened in the upper part of the Magothy(?) formation, where the preponderance of fine-grained materials limits the water-yielding capacity of the wells. Locally, there are more productive water-bearing zones, but these are generally of small vertical and lateral extent. The basal part of the Magothy(?) is the most productive water-yielding zone of the formation. Although relatively few wells were screened in this zone in 1960, test-well data indicate conditions favorable for development to meet future water demands. The Magothy(?) formation is the second most important source of water tapped by industrial and public-supply wells in the project area—particularly in or near the following localities: Centerport, Cold Spring Harbor, East Northport, Greenlawn, Indian Head, Kings Park, Melville, Smithtown, and South Commack. In or near these localities individual wells screened in the Magothy(?), at depths ranging from 246 to 593 feet, yield from 600 to 1,700 gpm. The specific capacity of individual wells ranges from 16 to 86 gpm per foot of drawdown and generally is somewhat lower than that of wells tapping water-bearing material in the Pleistocene deposits. The coefficients of transmissibility[1] of the Magothy(?) water-bearing material were computed from the specific capacity (Theis and others, 1954) of typical public-supply wells. On the basis of these values of transmissibility and an estimated thickness of aquifer, the computed coefficients of permeability[2] ranged from 450 to 750 gpd per sq ft (table 8). In 1957, approximately 44 percent of the total withdrawal for public supply and industrial use in the Huntington-Smithtown area was pumped from the Magothy(?) formation.

[1] The coefficient of transmissibility is the rate of flow of water, in gallons per day, at the prevailing temperature, through each vertical strip of aquifer 1 ft wide having a height equal to the thickness of the aquifer, and under a unit hydraulic gradient.

[2] The coefficient of permeability is the rate of flow of water, in gallons per day, through a cross section of 1 sq ft under a unit hydraulic gradient at a temperature of 60°F.

TABLE 8.—*Estimated permeability of water-bearing material in the Magothy(?) formation and Pleistocene deposits*

Well	Screen zone (ft below land surface)	Specific capacity (gpm per ft)	Permeability (gpd per sq ft)
Magothy(?) formation			
S12070	363–399, 409–445	50	550
S13876	246–298	38	450
S14521	459–496, 527–552	86	750
S15514	533–593	71	650
S15515	317–357	16	450
S16129	416–450, 505–547	78	650
Pleistocene deposits			
S874	100–130	91	
S11105	469–517	81	900
S11803	164–217	79	1,500
S15746	85–126	62	900
S15776	438–501	221	1,200
S16049	266–328	90	1,000
S16137	540–602	46	750

PLIOCENE(?) SERIES

MANNETTO GRAVEL

The type area of the Mannetto gravel is the Mannetto Hills of eastern Nassau County. Crosby[3] correlated these deposits with the Lafayette gravel of late Pliocene age. Fuller (1914, p. 85) considered the deposits to be remnants of a glacial outwash sheet of early Pleistocene age. The author has found no new evidence to support either interpretation of the age of this unit. The Geological Survey considers the Mannetto to be of Pliocene(?) age (Suter and others, 1949, footnote p. 9).

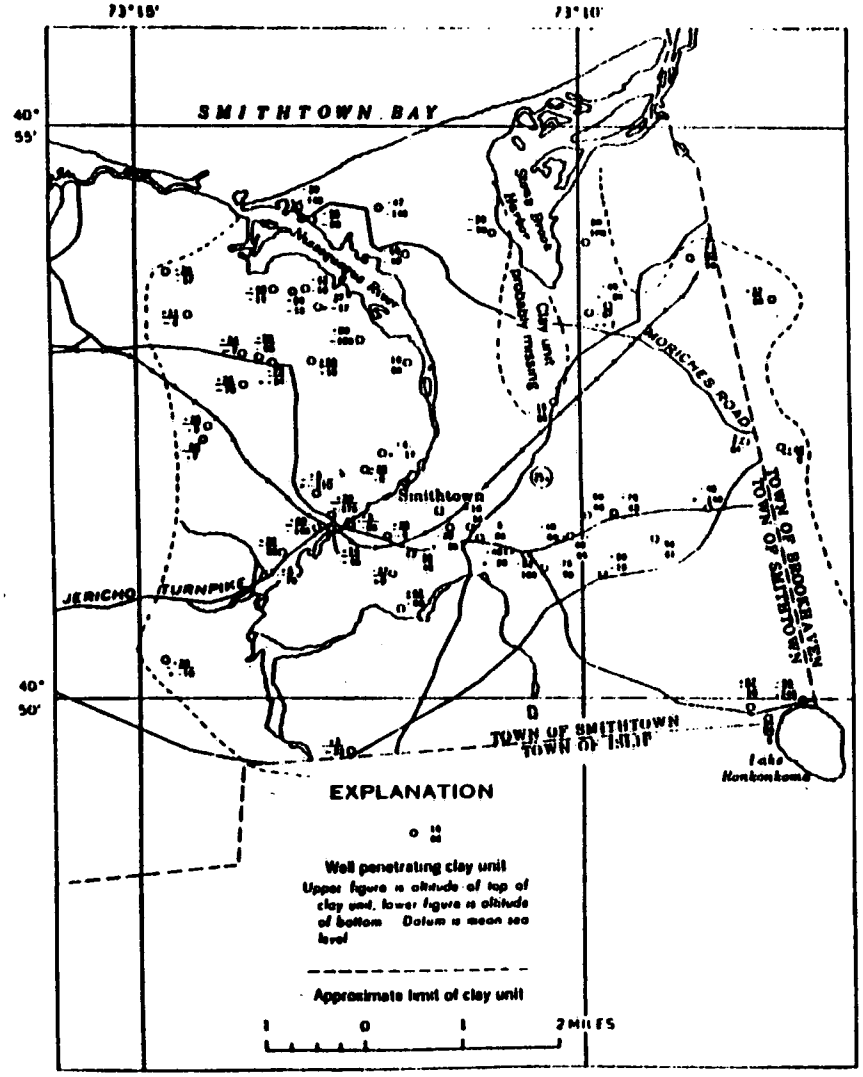
The Mannetto gravel has been identified by the author only in Huntington in exposures in the southern part of the West Hills where it rests on the buried Cretaceous surface. Other small outcrops were mapped by Fuller (1914, pl. 1) in the Dix Hills and several other places in the project area. These are not shown on plate 2 as the author was unable to confirm their presence. The Mannetto has also been correlated in a few well records (pl. 4).

In surficial exposures in the West Hills, the Mannetto gravel is largely composed of current-bedded quartz sand and gravel and, in places, layers of clay. The sand grains and the pebbles are commonly pitted. Rarely, weathered igneous and metamorphic rock and ferruginous sandstone fragments are present in the deposits.

[3] Crosby, W. O., 1910, Report on the geological relations of the ground water of Long Island: Board of Water Supply, City of New York, unpub. rept., p. 52.

fig. 3). Locally, thick but discontinuous clay bodies of Pleistocene age also have been penetrated in wells in other parts of the project area. In general, they lie in the larger buried valleys, the floors of which are commonly below sea level. The clay unit of Smithtown and the other discontinuous clay bodies may include equivalents of the Gardiners clay, as well as glaciolacustrine deposits laid down during the Wisconsin glacial stage. All these clay deposits are intercalated with coarse sand and gravel.

The saturated sand and gravel beds in the Pleistocene deposits yield moderate to large supplies of water to properly constructed



wells, but the clay bodies act as local confining beds for water-bearing zones in Pleistocene sand and gravel and also in places for water in the Cretaceous deposits. The Pleistocene deposits constitute the most important source of water in the project area for numerous small domestic wells and also for industrial and public-supply wells in and near the villages of Centerport, Dix Hills, Greenlawn Manor, Hauppauge, Huntington Station, Northport, and South Huntington. In these localities, individual public-supply wells screened in water-bearing sand and gravel beds of Pleistocene age at depths ranging from 100 to 602 feet yield from 1,000 to 1,700 gpm. Specific capacities of these wells range from 31 to 221 gpm per foot of drawdown and on the average are higher than those of wells tapping the Cretaceous deposits. Transmissibilities of Pleistocene water-bearing materials tapped by typical public-supply wells were computed from specific capacities (Theis and others, 1954). By the use of these values and the estimated thickness of the aquifer, permeabilities ranging from 750 to 1,500 gpd per sq ft (table 3) were computed. In 1957, ground-water withdrawals from wells screened in water-bearing sand and gravel of Pleistocene age accounted for 53 percent of the total pumpage for public supply and industrial use in the Huntington-Smithtown area.

UNDIFFERENTIATED DEPOSITS OF PLEISTOCENE AND PLIOCENE(?) AGE

In some of the deeper buried valleys of the project area, wells have penetrated sections of sand and gravel associated with bodies of silt and clay that may include equivalents of the Gardiners clay and the Jameco gravel of Pleistocene age and possibly the Mannetto gravel of Pliocene(?) age. As these deposits cannot be identified or defined areally on the basis of available faunal and lithologic evidence, they are grouped in undifferentiated deposits of Pleistocene age.

At well S16137T (see following log) in the South Huntington well field, an unusually thick section of these undifferentiated deposits was penetrated between depths of 202 and 604 feet (47 to 449 ft below sea level). The fine lignitic sand, silty clay, and clay between 202 and 407 feet may be an equivalent of the Gardiners clay. The remainder of the sand, gravel, silt, and clay sequence between 407 and 604 feet may include the Jameco gravel and possibly the Mannetto gravel.

At present (1960), well S16137 (pl. 4) is the only well known to tap the undifferentiated deposits. This well, screened from 540 to 602 feet in fine to coarse sand containing some gravel and clay, yields 1,400 gpm and has a specific capacity of 46 gpm per foot of draw-

	Thickness (feet)	Depth (feet)
S16137-T. (8E)		
[South Huntington Water District, 8th Ave., South Huntington, N.Y. Drilled 1957 by C. W. Lauman and Co., Inc. Test well. Casing diameter 4 in, screen set from 180 to 185 ft. Alt 155 ft. Driller's log]		
Recent deposits:		
Sandy loam, gravel, and clay layers	6	6
Upper Pleistocene deposits:		
Sand, coarse, and grit gravel, and clay layers; brown	40	46
Sand, coarse, and gravel; brown	94	140
Sand, medium to coarse, and a little gravel; brown	6	146
Sand, coarse, grit, and gravel; some clay; brown	10	156
Sand, coarse, grit and gravel; brown	9	165
Sand, fine to coarse, and some grit; brown	6	171
Sand, fine to coarse, and grit; some clay; brown	10	181
Sand, coarse, and grit; some clay; brown	4	185
Sand, fine to medium, and some clay; brown	7	192
Sand, fine; some clay and layers of sandy clay; brown	5	197
Sand, medium to coarse, and some clay; brown	5	202
Pleistocene deposits undifferentiated:		
Sand, fine, brown	4	206
Sand, fine, gray; lignite	9	215
Clay, sandy, gray	6	221
Clay, gray; layers of silty gray clay	20	241
Clay silty; layers of clay; gray	11	252
Clay; layers of silty clay; gray	9	261
Clay, gray	15	276
Clay, sandy; layers of fine sand and gravel; brown	11	287
Clay, sandy, brown	4	291
Clay, sandy; layers of fine sand and clay; brown	5	296
Sand coarse, and grit; layers of sandy clay; brown	6	302
Clay, sandy, grit, and gravel; layers of coarse sand; brown	5	307
Sand, fine, and sandy brown clay	4	311
Clay, sandy, and grit; layers of fine sand; brown	11	322
Sand, fine, grit; and sandy clay; brown	4	326
Clay and sandy clay; layers of fine sand; brown	5	331
Sand, fine, and grit; some clay and sandy clay; brown	6	337
Clay, sandy; layers of fine sand and grit; brown	5	342
Sand, fine, and sandy clay; brown	5	347
Sand, coarse, grit, and gravel; some clay; brown	4	351
Sand, fine, and grit; layers of sandy clay; brown	5	356
Sand, medium, grit, and sandy clay; brown	6	362
Sand, medium, and grit; some clay and lumps of sandy clay; brown	4	366
Sand, fine, brown	11	377
Sand, fine, and solid and sandy clay; brown	5	382
Clay, sandy; layers of medium to coarse sand and grit; brown	9	391
Sand, fine, layers of sandy clay and gravel; brown	4	395
Sand, fine, brown	6	401
Clay, sandy, solid, and grit and fine to coarse sand; brown	6	407
Sand, coarse, brown	5	412
Sand, fine to coarse, brown	5	417
Sand, coarse, brown	4	421
Clay, solid and sandy; layers of coarse sand and grit; gray	6	427
Sand, fine, clayey, gray; layers of sandy clay	5	432
Clay, sandy, gray	25	457
Sand, fine, brown	5	462
Sand, fine, clayey, brown	4	466
Clay, solid and sandy, and fine sand; brown	11	477
Clay, sandy, layers of fine sand; brown	5	482
Clay, sandy, brown	4	486
Sand, fine, brown	6	492

	Thickness (feet)	Depth (feet)
S16137-T. (8E)		
[South Huntington Water District, 8th Ave., South Huntington, N.Y. Drilled 1957 by C. W. Lauman and Co., Inc. Test well. Casing diameter 4 in, screen set from 180 to 185 ft. Alt 155 ft. Driller's log]		
Pleistocene deposits undifferentiated—Continued		
Sand, very fine, and sandy clay; streaks of clay; brown	6	511
Sand, coarse, grit, and gravel; brown	10	521
Sand very fine to fine, brown	5	526
Sand, medium to coarse, brown	5	531
Clay and sandy clay; streaks of fine brown sand	5	536
Sand, coarse, grit, and gravel	11	547
Sand, fine, brown	4	551
Sand, fine to coarse, grit, and gravel; brown	5	556
Sand, medium to coarse, brown	6	562
Sand, fine, brown	5	567
Sand, medium to coarse; some grit; brown	9	576
Sand, fine to coarse, brown	11	587
Sand, fine; layers of clay; brown	4	591
Sand fine, brown	13	604

UPPER PLEISTOCENE DEPOSITS

The upper Pleistocene deposits generally rest directly on the eroded surface of the Cretaceous deposits and form the bulk of the Pleistocene sequence in the Huntington-Smithtown area. In the northern part of the West Hills they lie on the Mannetto gravel of Pliocene(?) age, and in other places they lie on undifferentiated deposits of Pleistocene age. The upper Pleistocene deposits are thickest beneath the terminal moraines and in buried valleys, where in places they are more than 300 feet thick. The deposits include: (1) at least one and possibly two sheets of glacial till laid down directly as ground moraine by continental ice; (2) ice-contact deposits in the Ronkonkoma and Harbor Hill terminal moraines; (3) a considerable thickness of glaciofluvial deposits laid down by melt water streams in outwash plains and spillways during the advance, stagnation, and recession of the ice; and (4) discontinuous bodies of silt and clay laid down in glacial lakes and not exposed in the project area. The upper Pleistocene deposits are commonly brown, yellow, and gray.

A sheet of glacial till, generally less than 10 feet thick, forms a surficial mantle on most of the uplands of the project area north of the Harbor Hill end moraine. This till probably represents the ground moraine of the Harbor Hill ice. A second and older till sheet, largely buried but locally exposed in sand and gravel quarries in northwestern Nassau County, has been interpreted by Swarzenski (written communication, 1960) as the ground moraine of the Ronkonkoma ice. This till sheet also may be present in the Hunting-

The Ronkonkoma and Harbor Hill terminal moraines are largely composed of crudely stratified sand and gravel deposits showing slump and collapse features and containing isolated masses of till. Isolated or coalescing kames and interspersed kettles account for the irregular surface of these moraines.

The bulk of the upper Pleistocene deposits is composed of stratified coarse sand and gravel laid down by melt water streams. Thick discontinuous bodies of silt and clay, however, are common in the buried valleys (pl. 4). These bodies are probably glaciolacustrine deposits, which may have formed during the recession of the Ronkonkoma ice and prior to the advance of the Harbor Hill ice.

The "clay unit of Smithtown," which underlies much of Smithtown (fig. 3), was considered by H. R. Blank (written communication, 1928) to be a possible equivalent of the Gardiners clay. The author believes, however, that the unit is probably a glaciolacustrine deposit in the upper Pleistocene sequence and may have been laid down in a glacial lake or lakes during the wasting of the Ronkonkoma ice. This unit is in a large buried valley, which lies in the eastern part of Smithtown. Its areal extent is only approximately defined by well data. Local continuity, however, is indicated by several wells in the Smithtown and Kings Park area (pl. 4 and fig. 3). In the adjacent areas it was either not deposited or it was removed by later stream erosion. Its upper surface generally lies above sea level and reaches a maximum altitude of 70 feet. The thickness is variable and ranges from a few tens of feet to 200 feet. The unit is predominantly clay, but some lenses of sand containing gravel and silt are found locally. The clay unit is generally brown or gray, which is characteristic of the upper Pleistocene deposits.

In many places a water-bearing sand and gravel zone (pl. 4) underlies this clay unit and is tapped by wells. The coarser materials are generally below sea level, and probably extend down to the underlying Cretaceous surface. At well S11810 in Smithtown, the sand and gravel zone rests on the Magothy(?) formation and is about 70 feet thick. Presumably, the sand and gravel were deposited by melt water streams during the advance of the Ronkonkoma ice.

An upper zone of gravelly stratified deposits commonly rests on the higher parts of the Cretaceous surface and on the Pleistocene clay bodies. This zone generally consists of yellow and brown layers of medium sand to coarse gravel containing a few boulder-size rock fragments. Rock fragments of igneous and metamorphic origin also are typically present. Much of this zone is not water bearing, as it lies above the zone of saturation.

RECENT SERIES

Deposits of Recent age are not extensive in the Huntington-Smithtown area, and their thickness is rarely more than 20 feet. These deposits include beach sand and gravel, organic silt and clay in small ponds and marshes, and marine silt and clay in the north-shore bays and harbors. A soil zone of variable texture and generally less than 5 feet thick blankets the Pleistocene and Cretaceous deposits. The soil is characteristically loamy in most of the area, although in the central part of Smithtown it is somewhat sandy.

The water-yielding potential of the Recent deposits is small, owing to small areal distribution and thickness. The sand and gravel in the beaches and tombolos generally yield only brackish water, but in places the water is relatively fresh and is tapped by shallow driven wells for domestic supply. The marine silt and clay deposits in the north-shore bays and harbors act as aquicludes, which retard the landward encroachment of salt water and confine underlying fresh water in the coastal zones.

GROUND WATER

All the fresh water that occupies the intergranular voids of the Cretaceous, Pliocene(?), and Pleistocene unconsolidated deposits constituting the ground-water reservoir above bedrock is ultimately derived from precipitation. Of the total precipitation, part runs off on the land surface, part returns to the atmosphere by evapotranspiration, and part seeps down to the water table and replenishes the ground-water reservoir. Some of the water that reaches the water table circulates in the shallow part of the ground-water reservoir, but the rest moves down into the intermediate and deep parts of the reservoir, which, in places, is as much as several hundred feet below sea level. Water is discharged naturally from the reservoir by evapotranspiration in areas where the water table is close to the land surface, by effluent seepage into streams, and by upward leakage into salt water near the shoreline and offshore.

WATER-BEARING UNITS

Three discrete aquifers or water-bearing units have been recognized in the ground-water reservoir of the Huntington-Smithtown area. Each of these comprises parts of two or more of the stratigraphic units previously described and summarized in table 2. In addition, local bodies of ground water perched above the main water table have been observed at several places in the project area. The aquifers are defined chiefly by the hydraulic continuity deduced from the behavior of water levels in wells and by the de-

presence or absence of extensive confining beds or aquicludes. In this report the aquifers are designated as shallow, intermediate, and deep. The shallow and intermediate aquifers are separated only imperfectly by discontinuous silt and clay bodies. The intermediate and deep aquifers are separated much more effectively by a silt and clay aquiclude, which is relatively thick and areally extensive. Consequently, water is interchanged much more readily between the shallow and intermediate aquifers than between the intermediate and deep aquifers. The characteristics and limits of the perched ground-water bodies, the three aquifers and their related water-table and piezometric surfaces, and the nature of water-level fluctuations in wells tapping these aquifers are described and discussed in following sections.

PERCHED GROUND-WATER BODIES

Discontinuous bodies of perched water are fairly common in the Huntington-Smithtown area. These generally lie on relatively thick layers of impermeable glacial till or on clay of Pleistocene age or on the Magothy(?) formation above the regional or main water table. The most extensive perched ground-water body occurs in the Harbor Hill end moraine in the northern part of the West Hills. Other perched bodies have been noted during the drilling of wells S16276 at Northport, S16880 at San Remo, and S16873 at Deer Park (pl. 1). Several wells that have tapped perched water bodies at altitudes as much as 200 feet above the main water table also are described by Veatch and others (1906, pl. 12). Wells S229 and S16876, both in West Neck, probably penetrate perched water bodies.

Domestic wells are generally not finished in perched water bodies, because yields are small and relatively undependable.

SHALLOW AQUIFER

The shallow aquifer generally includes saturated coarse sand and gravel in the upper Pleistocene deposits and, in some areas, hydraulically connected finer grained sand and gravel beds in the upper part of the Magothy(?) formation. Locally, saturated Manetto gravel may also form part of the shallow aquifer. The shallow aquifer extends beneath the land area of the project, and it terminates at or near Long Island Sound. Fresh-water lenses in the shallow aquifer also occur on Lloyd Neck, Eatons Neck, and Little Neck. The aquifer extends from about 90 feet above to about 80 feet below sea level. Through this range, water in the aquifer is generally unconfined.

The upper limit of the aquifer is the regional or main water table (pl. 5). The lower limit is marked by discontinuous clay bodies,

othy(?) formation. In much of Smithtown a relatively extensive glaciolacustrine clay unit in the upper Pleistocene sequence forms the lower limit of the aquifer at levels ranging from about 70 feet above to 80 feet below sea level. In some parts of the project area, specifically where the buried Cretaceous surface (pl. 3) lies at altitudes above 100 feet, the Magothy(?) formation forms the entire shallow aquifer. Because of differences in permeability—lower in the Magothy(?) and higher in the Pleistocene—the hydraulic gradient within the aquifer may change markedly near the contacts of these two stratigraphic units.

Local ground-water bodies, which may be considered to represent detached segments of the shallow aquifer, are present on Lloyd Neck, Little Neck, and Eatons Neck. These bodies, shown by closed 5- and 10-foot contours (pl. 5), are sustained very largely by local recharge, and possibly also on Lloyd Neck and Little Neck by upward leakage from the intermediate and deep aquifers.

The configuration of the main water table in May 1959, shown in plate 5, is based on water-level measurements in 51 observation wells and on water-surface altitudes observed in effluent streams and ponds that intersect the water table. Two prominent mounds on the main water-table divide of Long Island are present in the project area. The western mound includes all the broad area above the 70-foot contour in south-central Huntington, but only a small part of the eastern mound, above the 70-foot contour, is included in the easternmost part of Smithtown (pl. 5). Between these two mounds is a pronounced low, or trough, in the water table, which coincides roughly with the valley of the Nissequogue River. Two ground-water mounds represented by the closed 80- and 90-foot contours are present on the eastern high. The eastern mound (80-ft closed contour mostly north of well S16873) is apparently related to material of low permeability in the Magothy(?) formation which constitutes the shallow aquifer in this area. On the other hand, the western mound (90-ft closed contour) appears to be related to material of low permeability in the Pleistocene deposits.

North of the western mound, the water table slopes generally north toward Long Island Sound at gradients of about 15 to 30 feet per mile. However, southward deflections and reentrants in the 10- and 20-foot contours and local steepening of gradients are indicated near Cold Spring, Huntington, Centerport, and Northport Harbors (pl. 5). Between the western and eastern mounds the water table slopes generally toward the Nissequogue River at 20 to 30 feet per mile. North of the eastern mound the water table also slopes north toward the

foot, and are commonly masked by fluctuations of larger amplitude. Cyclical fluctuations in pressure also result from ocean tides, particularly in wells screened in the intermediate and deep aquifers near Long Island Sound. For example, at well S2020 located on a promontory between Duck Island Harbor and Northport Bay and screened in the deep aquifer, water-level fluctuations caused by tidal loading have a daily amplitude of as much as 3 feet between high and low tide. Tidal changes in Lloyd and Cold Spring Harbors also influence the water levels of wells S9 and S4466, both of which are screened in the deep aquifer.

RECHARGE

All the fresh water in the ground-water reservoir of the project area, as well as the rest of Long Island, is derived from precipitation. However, only a part of the total precipitation that falls reaches the water table. The amount which percolates down to the water table and recharges the reservoir is the residual of the total precipitation not returned to the atmosphere by evapotranspiration or lost to the sea by overland runoff. Owing to the highly pervious nature of the soil and the substrata and to the gentle slopes of the land surface, infiltration is relatively high. Of an average annual precipitation on the project area of 49 inches, 21 inches, or about 43 percent, is estimated to reach the water table.

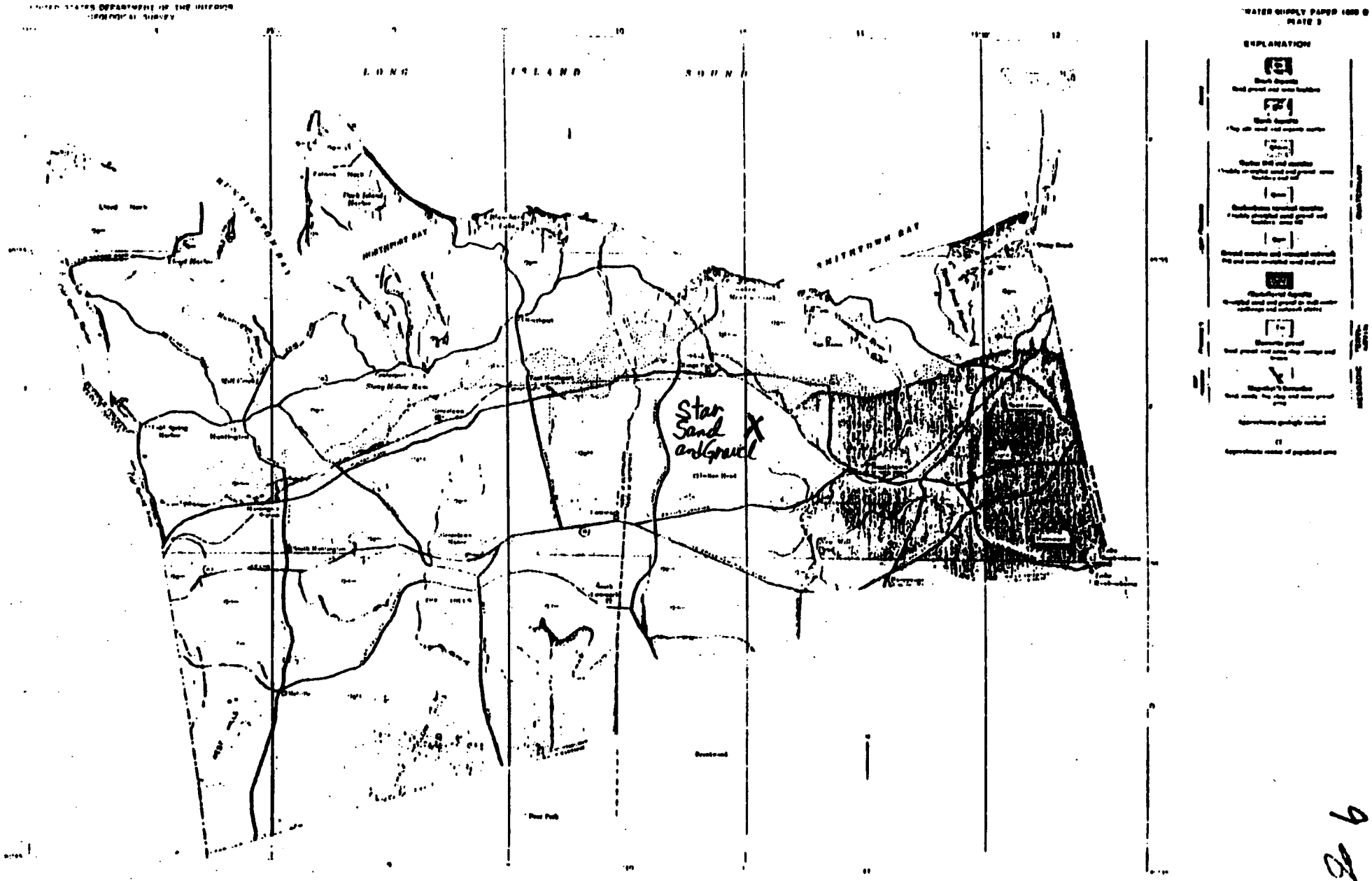
The catchment surface on which recharge presumably takes place includes most of the land area of the project, or about 146 square miles. This catchment includes Lloyd and Eatons Necks but does not include an additional 7 square miles of high water table and tidal marshes which fringe the northern shoreline. A considerable part of the catchment area, however, is made impervious by buildings and pavements, but much of the runoff from such covered areas is recovered in storm water disposal (recharge) basins or large-diameter diffusion wells. The natural recharge from precipitation on the project area, exclusive of the high water-table areas, the tidal marshes and of Lloyd and Eatons Necks, is estimated to average about 140 mgd (million gallons per day). In addition, the recharge on Lloyd Neck is estimated to average about 5 mgd and on Eatons Neck about 2 mgd. The total for the project area then would be about 147 mgd. The rate of natural recharge varies greatly from season to season and from year to year depending on such factors as evapotranspiration, air and soil temperatures, soil-moisture conditions, and the nature and seasonal distribution of precipitation. During dry years, recharge is substantially less than average, and conversely in wet years it is more.

Natural replenishment of the intermediate and deep aquifers takes place entirely by downward movement of water from the shallow aquifer through discontinuities in clayey and silty beds and probably directly by slow movement through these aquicludes. Recharge of the intermediate aquifer probably occurs chiefly in the areas where the water table lies above an altitude of about 60 feet (pl. 5). The deep aquifer, in turn, receives recharge by downward leakage from the intermediate aquifer through an extensive aquiclude formed chiefly by the clay member of the Raritan formation. This recharge, which probably proceeds at a very slow rate, occurs chiefly where the piezometric surface of the intermediate aquifer lies above an altitude of about 60 feet (fig. 6).

Artificial recharge of the ground-water reservoir is effected by means of cesspools and septic tanks, which ultimately receive most of the water pumped from public-supply and domestic wells. For example, during 1957 an estimated average of about 9.8 mgd was returned to the ground by this means in the project area, and at the same time about 2.5 mgd was discharged directly into Long Island Sound through sewage disposal systems at the villages of Huntington and Northport and at Kings Park State Hospital. Also, as required by law, an average of about 0.7 mgd of water pumped from privately owned wells for industrial and cooling purposes during 1957 was returned to the ground through sumps and diffusion wells.

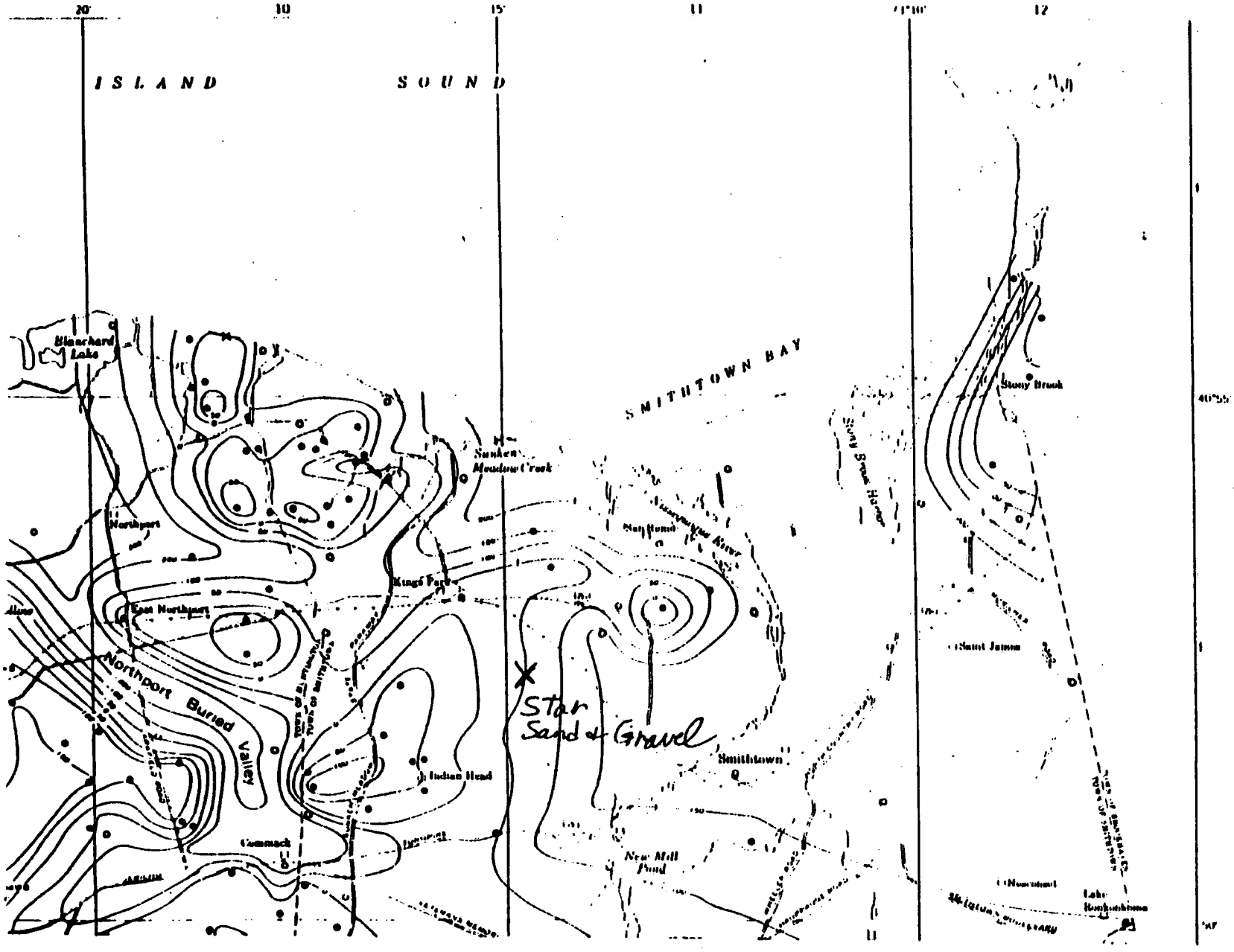
MOVEMENT

In the ground-water reservoir, water moves vertically and laterally from points of high head to points of low head along flow lines whose direction is normal to the contour lines shown for the water table (pl. 5) and the piezometric surfaces (figs. 6 and 9). Water in the shallow aquifer flows away from the two major highs on the main watertable divide of Long Island, represented by areas above the 70-foot watertable contour in south-central Huntington and eastern Smithtown (pl. 5). The general directions of ground-water flow are north toward the Long Island Sound, south toward the Atlantic Ocean, and also a pronounced lateral movement toward the trough in the valley of the Nissequogue River. Local directions of flow, which may deviate substantially from these general directions, are indicated by arrows on the water-table contours (pl. 5). Also, the peninsulas of Lloyd, Eatons, and Little Necks each contain a ground-water mound in the shallow aquifer and from the crests of these mounds the shallow ground water moves laterally outward to bounding salt-water bodies. Within the area circumscribed by the 60-foot water-table contour (pl. 5), a downward head differential generally exists between the shallow and intermediate aquifers. Conse-



GEOLOGIC MAP OF THE HUNTINGTON-SMITHTOWN AREA, SUFFOLK COUNTY, NEW YORK
SHOWING AREAL EXTENT OF SURFICIAL DEPOSITS

WATER-SUPPLY PAPER 1669-D
PLATE 3



EXPLANATION

Contour on Cretaceous surface
Contour interval 50 and 100 feet
Datum is mean sea level

Well penetrating Cretaceous surface (chiefly Magothy(?) formation)

Well penetrating deep Pleistocene deposits only

Magothy(?) formation observed in excavation

Outcrop of Magothy(?) formation

Approximate center of populated area

MAP OF THE HUNTINGTON-SMITHTOWN AREA, SUFFOLK COUNTY, NEW YORK, SHOWING APPROXIMATE CONTOURS ON THE BURIED CRETACEOUS SURFACE

REFERENCE NO. 23

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1 of 1

COMMUNICATIONS RECORD FORM

Distribution: (X) Star Sand + Gravel Site File, ( ) _____
( ) _____, ( ) _____
( ) Author

Person Contacted: Ron Smalls Date: 3-28-86

Phone Number: 516-289-1655 Title: _____

Affiliation: Country Well Drilling Corp. Type of Contact: Phone

Address: 1612 North Ocean Ave. Person Making Contact: JAS
Hauppauge, NY 11742

Communications Summary: On site wells?

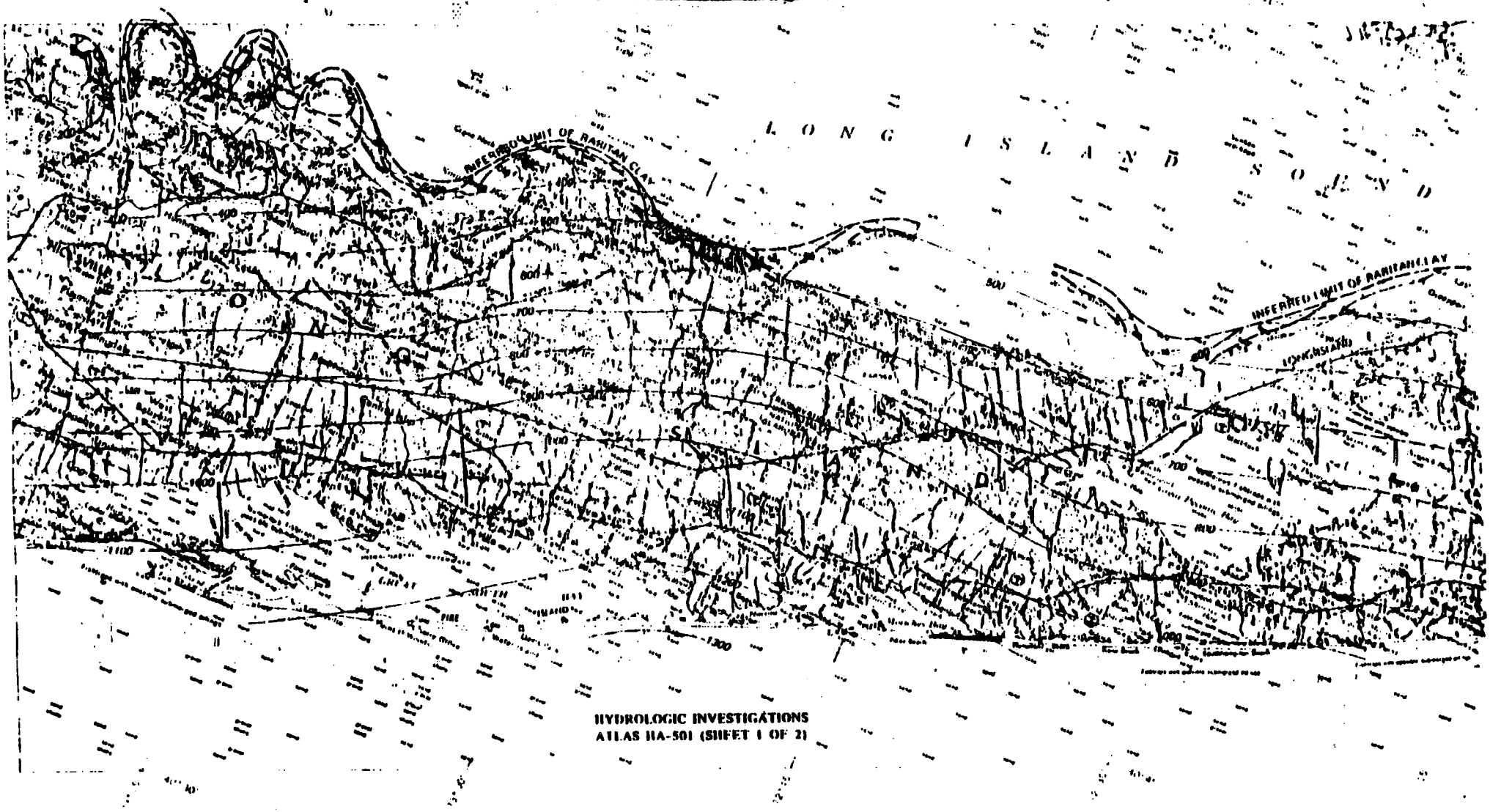
Country Well Drilling Corp. installed the two monitoring wells on site. Not the production well.

Ron said that the rock at the two wells are about 60-70 feet deep + were installed about 5 feet into first water. No soil samples were collected, but Ron said that no clay was encountered. All 60-70 feet was sand (+gravel).

(see over for additional space)

Signature: James A. Smith

REFERENCE NO. 24



HYDROLOGIC INVESTIGATIONS
ATLAS HA-501 (SHEET 1 OF 2)

MAP SHOWING ALTITUDE OF TOP OF RARITAN CLAY

SCALE 1:250,000

0 5 10 15 20 25 MILES

0 5 10 15 20 25 30 35 KILOMETERS

CONTOUR INTERVALS 25, 50, AND 100 FEET
DATUM IS MEAN SEA LEVEL

Prepared in cooperation with the
SUFFOLK COUNTY WATER AUTHORITY
and
SUFFOLK COUNTY DEPARTMENT OF ENVIRONMENTAL CONTROL

HYDROGEOLOGY OF SUFFOLK, COUNTY, LONG ISLAND, NEW YORK

By

H. M. Jensen and Julian Soren

1974

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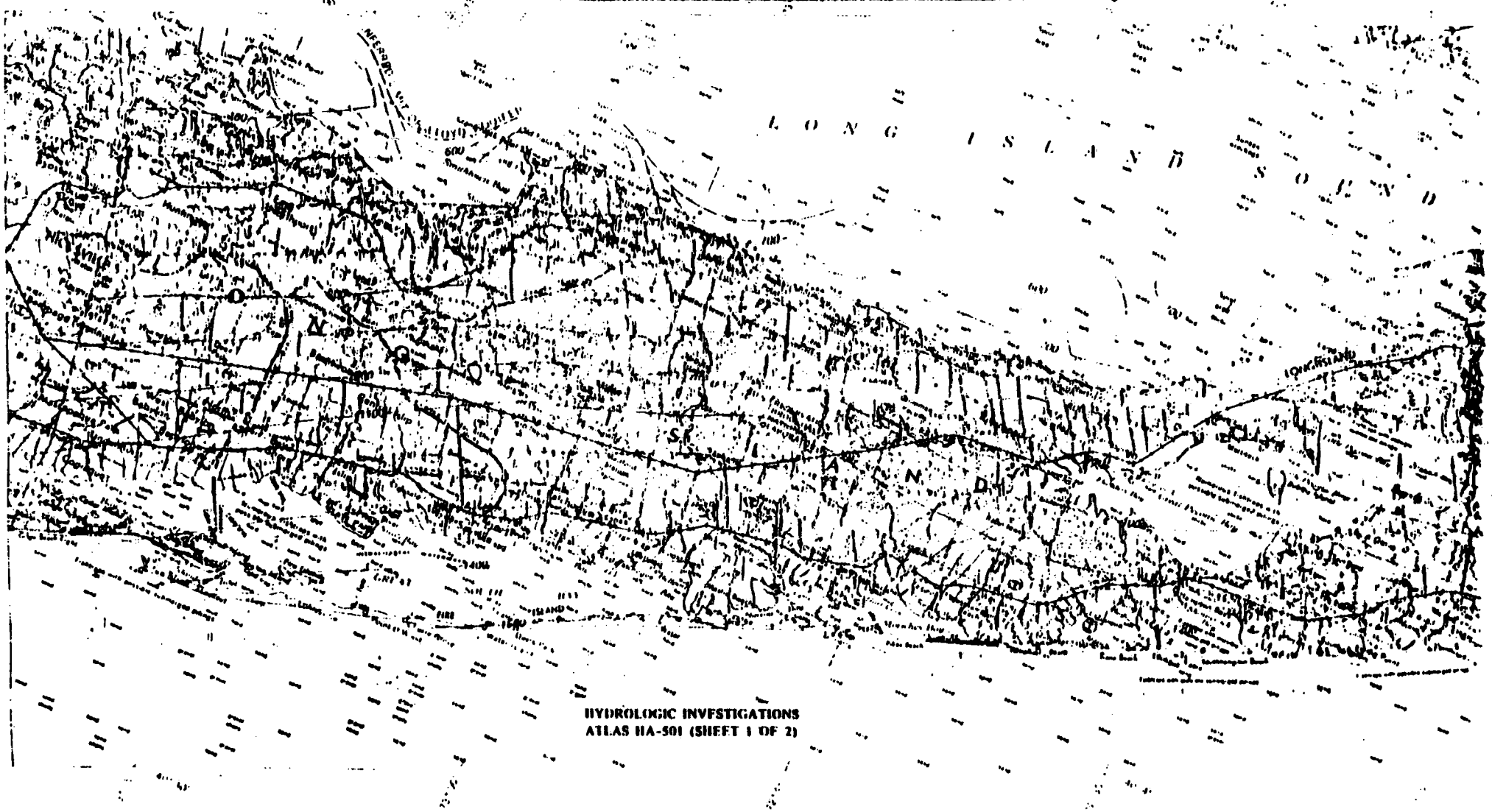
1974



HYDROLOGIC INVESTIGATIONS
ATLAS HA-501 (SHEET 1 OF 2)

MAP SHOWING ALTITUDE OF TOP OF LLOYD AQUIFER

SCALE 1:250,000

0 5 10 15 20 25 MILES

0 5 10 15 20 25 30 35 KILOMETERS

CONTOUR INTERVALS 25, 50, AND 100 FEET
DATUM IS MEAN SEA LEVEL

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By

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1974

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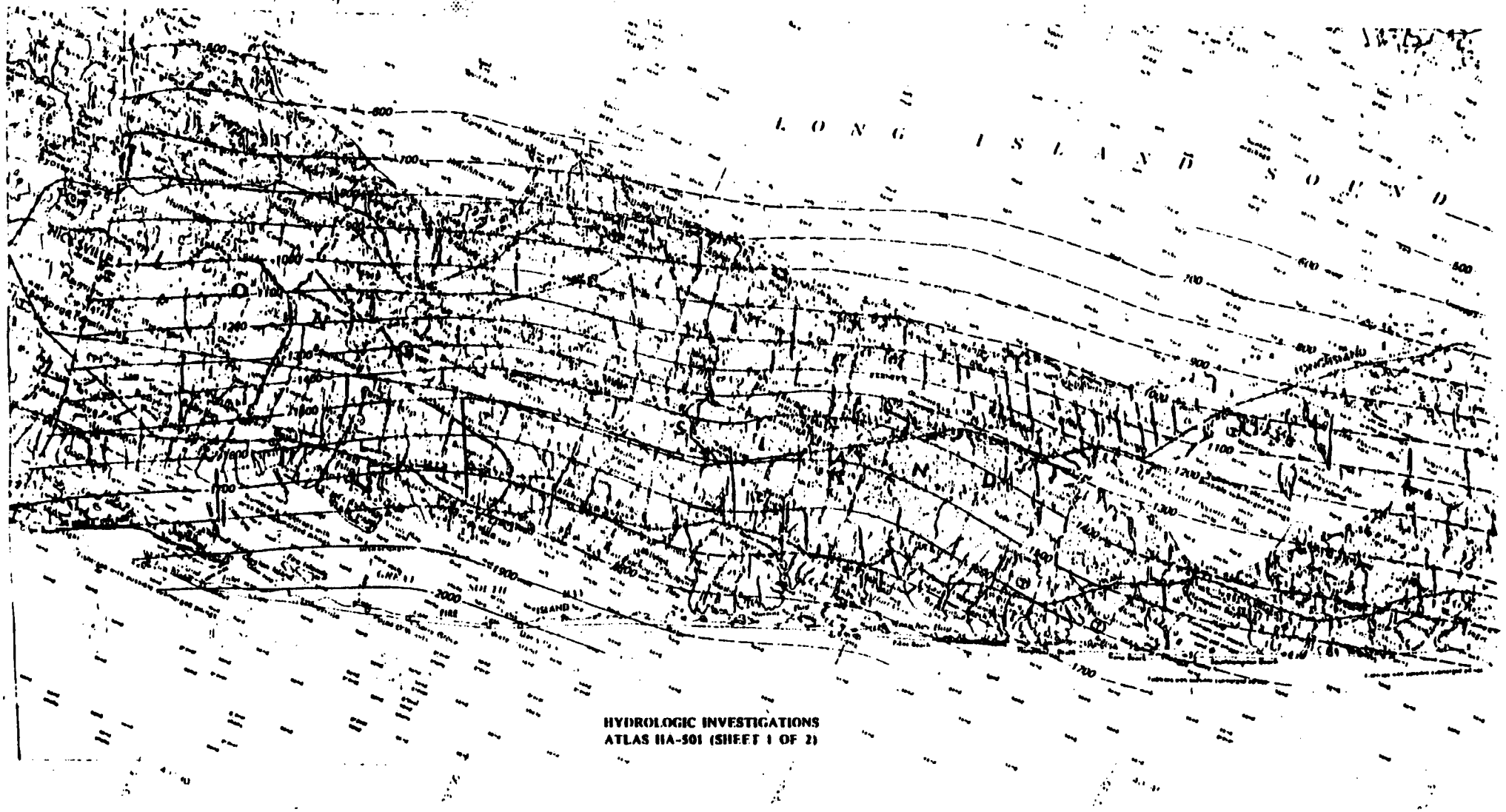

HYDROLOGIC INVESTIGATIONS
ATLAS HA-501 (SHEET 1 OF 2)

MAP SHOWING CONFIGURATION OF THE BEDROCK SURFACE

SCALE 1:250,000

0 5 10 15 20 25 MILES

0 5 10 15 20 25 30 35 KILOMETERS

CONTOUR INTERVALS 25, 50, AND 100 FEET
DATUM IS MEAN SEA LEVEL

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HYDROGEOLOGY OF SUFFOLK, COUNTY, LONG ISLAND, NEW YORK

By

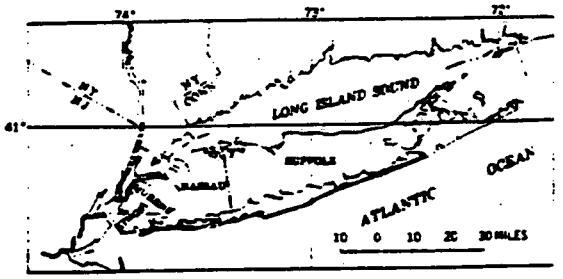
H. M. Jonson and Julian Soren

1974

INTRODUCTION

WATER NEEDS OF SUFFOLK COUNTY

Water pumped from aquifers underlying Suffolk County (index map) is the sole source of water used for public supply, agriculture, and industry. The county's population grew from less than 200,000 in 1940 to 1.1 million in 1970. Most of the growth occurred after 1950. Ground-water pumpage increased from 40 mgd (million gallons per day) in 1950 to 155 mgd in 1970 (New York State Department of Environmental Conservation, written commun., June 1, 1971). The projected ground-water use for an anticipated population of 2 million in the county by 1990 is 300 mgd (New York State Conservation Department, 1970, p. 26–27).



INDEX MAP SHOWING LOCATION (SHADED) OF SUFFOLK COUNTY

PURPOSE AND SCOPE

The large and growing demand for ground water in Suffolk County has created a need for a detailed knowledge of the geometry and the hydrologic characteristics of the ground-water reservoir. Mapping of subsurface geology and hydraulic heads in the aquifers are important prerequisites to obtaining this information. Maps of the subsurface geologic units of Long Island were first shown in a report by Suter and others (1949, pls. VIII to XXI). But those maps were highly generalized, because there were few data on deep borings and wells in the county when the report was prepared. Since 1949, additional data from many deep borings and wells in the county have been collected.

In 1968, as part of a continuing cooperative program of water-resources studies with the Suffolk County Water Authority and Suffolk County Department of Environmental Control, the U.S. Geological Survey began an updating of the hydrogeologic and hydrologic maps of all the county. The basic data in Jensen and Soren (1971), the first product of the program, are the basis for the hydrologic maps in this report.

ACKNOWLEDGMENTS

The authors appreciate the cooperation of well-drilling companies, their employees, and the many officials of public and private water companies who furnished geologic and hydrologic data for use in this report.

GEOLOGIC AND HYDROGEOLOGIC UNITS

Pleistocene glacial drift generally mantles the county's surface. Pleistocene deposits overlie unconsolidated deposits of Late Cretaceous age. The Cretaceous strata lie on a peneplain that was developed on Precambrian(?) crystalline rocks.

Major landforms include ridges, valleys, and plains. These landforms are roughly oriented in belts parallel to the county's length. The northern and the central parts are traversed by irregular sandy and gravelly ridges of terminal moraine. The crest of the northern ridge ranges in height from 100 to 300 feet above sea level and the crest of the central ridge from 150 to 400 feet. The highest altitudes in the inter-ridge area range from 100 to 200 feet. Irregular plains and rolling hills, formed from sandy and gravelly ground moraine and outwash deposits of sand and gravel lie in the area between the ridges. An outwash plain slopes at a near-uniform gradient from the southern base of the central ridge, which is about 100 feet above sea level, southward to Great South Bay and the ocean. Along the north shore, steep bluffs as high as 100 feet and generally narrow sandy and gravelly beaches face Long Island Sound. The barrier-bar system at the southernmost side of the county is composed of sandy beach and dune deposits. The highest altitudes of the barrier bars generally range from 10 to 45 feet.

The ground-water reservoir system of Suffolk County is composed of hydrogeologic units that include lenses and layers of clay, silt, clayey and silty sand, sand, and gravel. A hydrogeologic unit consists of a geologic unit or a group of contiguous geologic units classified by hydraulic characteristics. These units include aquifers, which are principal water sources, and confining layers, which separate the aquifers. The aquifers are, from the land surface downward, the upper glacial aquifer, the Magothy aquifer, and the Lloyd aquifer. The major areal confining layers are, in descending order, the Gardiners Clay, the Monmouth greensand, and the Raritan clay. The base of the ground-water reservoir is the crystalline bedrock. Characteristics of the geologic and the hydrogeologic units are summarized in the table, and the following data of hydrologic significance are shown on the maps: base of ground-water reservoir, altitudes of aquifers, altitudes and limits of confining layers, and distribution of surficial deposits. The hydrogeologic sections show the vertical relations of the units to each other.

The sharp angular shapes of some of the contours reflect the fact that in places the contours are drawn on stratigraphic tops of the hydrogeologic units and in places the contours are drawn on erosional surfaces. The sharp angles result from the juncture of a stratigraphic top and an eroded surface.